

**ENVIRONMENTAL SERVICES
SPB05-894P-CC**

1. PARTIES

THIS CONTRACT, is entered into by and between the State of Montana, Department of Administration, State Procurement Bureau, (hereinafter referred to as "the State"), whose address and phone number are Room 165 Mitchell Building, 125 North Roberts, PO Box 200135, Helena MT 59620-0135, (406) 444-2575 and **Tetra Tech EM, Inc.**, (hereinafter referred to as the "Contractor"), whose nine digit Federal ID Number, address and phone number are 62-1080561, 7 West 6th Avenue, Suite 612, Helena MT 59601, and (406) 442-5588.

THE PARTIES AGREE AS FOLLOWS:

2. PURPOSE

The purpose of this term contract is to establish a list of Environmental Service Providers in several service areas. All qualified offerors will be assembled into a multiple contractor term contract for use by state agencies and other public procurement units. The State makes no guarantee of use by any agency-authorized access to this term contract. However, through data conveyed by the Montana Department of Environmental Quality, Montana Department of Natural Resources and Conservation, and Montana Fish, Wildlife and Parks, it is anticipated that this term contract should access approximately 2.5 million dollars or more annually.

3. EFFECTIVE DATE, DURATION, AND RENEWAL

3.1 Contract Term. This contract shall take effect upon execution of all signatures, and terminate on June 30, 2007, unless terminated earlier in accordance with the terms of this contract. (Mont. Code Ann. § 18-4-313.)

3.2 Contract Renewal. This contract may, upon mutual agreement between the parties and according to the terms of the existing contract, be renewed in one-year intervals, or any interval that is advantageous to the State, for a period not to exceed a total of four additional years. This renewal is dependent upon legislative appropriations.

3.3 Addition of Analytical Laboratory Contractor. Proposals will be accepted between April 1 and May 1 of each calendar year from current firms requesting review of their qualifications to perform Analytical Laboratory Services as originally requested under RFP SPB05-894P. The state will evaluate each proposal received in the exact manner in which the original proposals for other categories were evaluated. If proposal passes the requirements as evaluated to perform Analytical Lab Services, the state will update that firms term contract to include the Analytical Lab Services category contingent on said firm being in good standing otherwise.

4. NON-EXCLUSIVE CONTRACT

The intent of this contract is to provide state agencies with an expedited means of procuring supplies and/or services. This contract is for the convenience of state agencies and is considered by the State Procurement Bureau to be a "Non-exclusive" use contract. Therefore, agencies may obtain this product/service from sources other than the contract holder(s) as long as they comply with Title 18, MCA, and their delegation agreement. The State Procurement Bureau does not guarantee any usage.

5. COOPERATIVE PURCHASING

Under Montana law, public procurement units, as defined in section 18-4-401, MCA, have the option of cooperatively purchasing with the State of Montana. Public procurement units are defined as local or state public procurement units of this or any other state, including an agency of the United States, or a tribal procurement unit. Unless the bidder/offeror objects, in writing, to the State Procurement Bureau prior to the award of this contract, the prices, terms, and conditions of this contract will be offered to these public procurement units.

6. TERM CONTRACT REPORTING

Term contract holder(s) shall furnish annual reports of term contract usage. Each report shall contain complete information on all public procurement units utilizing this term contract. Minimum information required to be included in usage reports: name of the agency or governmental entity who contacted you regarding a potential project; project title; agency contact person; if the project was not successfully negotiated, state the reason; number and title of contracts received; total dollar amounts for contracts received; the names of your company personnel involved in the project; and project status as of usage report date. The report for this term contract will be due on July 20th of each year.

Reported volumes and dollar totals may be checked by the State Procurement Bureau against State records for verification. Failure to provide timely or accurate reports is justification for cancellation of the contract and/or justification for removal from consideration for award of contracts by the State.

7. COST/PRICE ADJUSTMENTS

7.1 Cost Increase by Mutual Agreement. After the initial term of the contract, each renewal term may be subject to a cost increase by mutual agreement. Contractor must provide written, verifiable justification for any cost adjustments they request during each renewal period. Contractor shall provide its cost adjustments in both written and electronic format.

7.2 Differing Site Conditions. If, during the term of this contract, circumstances or conditions are materially different than set out in the specifications, the Contractor may be entitled to an equitable adjustment in the contract price. The Contractor shall immediately cease work and notify, in writing, the State of any such conditions necessitating an adjustment as soon as they are suspected and prior to the changed conditions affecting the performance of this contract. Any adjustment shall be agreed upon in writing by both parties to the contract.

7.3 Cost/Price Adjustment. All requests for cost/price adjustment must be submitted between April 1st and April 30th along with written justification. Requests received after April 30th will not be considered unless written approval from the SPB Contracts Officer is given to submit at a later date. In no event will cost/price adjustments be allowed beyond May 15th. All requests that are approved will be incorporated by contract amendment and made effective July 1st of the next approved renewal period.

8. SERVICES AND/OR SUPPLIES

8.1 Service Categories. Contractor agrees to provide to the State the following services:

Water Quality Monitoring – Fixed Station and Probabilistic Design. The statewide monitoring network has three components. The first component is the fixed station water quality-monitoring network. There are 38 fixed station sites located on streams throughout Montana where there are active USGS gauging stations. The USGS is currently contracted to collect all of the water chemistry samples. The State may also collect sediment samples for trace metal analyses. Remote sensing may be used to assess stream geomorphology, flood plain and watershed characteristics.

Water Quality Monitoring - Lakes and Streams. As part of the monitoring program, standards criteria and TMDL development, lakes will continue to be sampled collecting chemistry, physical, and habitat parameters. Stream sampling may include sediment and water chemistry, geomorphology, habitat, or sources of pollutants (e.g., pebble counts, channel cross-section, stream reach assessments, photo points, Rosgen Type II, etc GIS and remote sensing may be used to assess riparian habitats, and watershed physical characteristics.

Water Quality Monitoring - Reference Sites. As part of the monitoring program and standards criteria development, reference sites will continue to be identified and characterized as described in 3.5.2.

TMDL Targets. The TMDL program (within DEQ) will often need additional data in order to develop TMDL targets. Targets are quantitative water quality goals or “endpoints” that represent all the applicable

narrative or numeric water quality standards. These targets, when achieved will represent full beneficial use support. This may require additional monitoring to determine reference condition when TMDL targets are based on narrative criteria or designated uses (water quality standards). Targets may be based on numeric water quality criteria, pollutant concentrations or loads, habitat or geomorphic measures, and/or biological criteria or populations. Targets are also used to determine the existing Water Quality Impairment Status (WQIS) of the streams on the 303(d) list. In most cases, the contractor will be required to write a report, which includes a recommendation and justification for one or more TMDL targets and also compare those targets to the existing conditions to determine WQIS. Communication with the State is crucial while deriving preliminary targets to ensure TMDL consistency across Montana. For consideration in this service area, the contractor should also have experience and be accepted for service categories 3.5.4 and 3.5.12-15.

TMDL Source Assessment/Delineation. The TMDL program (within DEQ) will often need additional data in order to link water quality impairments to their sources, or to allocate sources of pollutants. This may require data compilation, investigative monitoring and statistical analysis within a specified watershed, which can be used for source allocation, or the linkage of water quality impairments to causes and sources of impairment (e.g., sediment or land use practices). Quantitative source assessments may be conducted using field-based monitoring and/or interpretation and analysis of aerial photos, digital images, or GIS coverages depending upon impairment sources and available information. In most cases, contractors will be required to write a report that identifies what the major causes of impairment are and where the major sources of pollutants are located. DEQ will also need to have all pollution/pollutant sources quantified. The quantification of these loads will assist in both source load allocations and the total maximum daily loads. In addition, data collected during source assessments must be entered into an approved database structure or format and linkage to the National Hydrography Dataset (NHD) streams layer may be requested. The department may also request a cost/benefit analysis for implementing BMPs, which can be used for developing TMDL source allocations. Communication with the State is crucial while deriving assessing sources of pollutants to ensure TMDL consistency across Montana. For consideration in this service area, the contractor should also have experience and be accepted for service categories 3.5.4, 3.5.6, and 3.5.12-15.

TMDL Load Allocations. The TMDL program (within DEQ) will often need additional data in order to develop load allocations in conjunction with the source assessment/delineation. Load allocations are the portion of a receiving water's loading capacity that is attributed to existing or future point or non-point sources of pollution or to natural background sources. Load allocations are best estimates of the loading, which can range from reasonably accurate estimates to gross allotments. Allocation can be expressed as a percent reduction that results in a maximum allowable load or as performance-based, which demonstrates how BMPs will be applied and how they will reduce the current loads. Communication with the State is crucial while deriving preliminary load allocations to ensure TMDL consistency across Montana. For consideration in this service area, the contractor should also have experience and be accepted for service categories 3.5.4, 3.5.6-7, and 3.5.12-15.

Total Maximum Daily Loads. The TMDL program (within DEQ) will often need additional data in order to develop Total Maximum Daily Loads (TMDLs). A TMDL is defined as the sum of the wasteload allocations to point sources, load allocations to non-point sources and natural background sources with a margin of safety considering seasonal variation. TMDLS can be expresses in terms of mass per time, toxicity, or other appropriate measures that relate to the State's Water Quality Standards. Communication with the State is crucial while deriving preliminary TMDLs to ensure consistency across Montana. For consideration in this service area, the contractor should also have experience and be accepted for service categories 3.5.4, 3.5.6-8, and 3.5.12-15.

Stakeholder Participation. The TMDL program (within DEQ) will often need additional assistance in order to develop implementation/restoration strategies and monitoring plans. These plans often require public involvement with the local stakeholders. These efforts typically results in developing the measures needed to achieve full beneficial use support or to monitoring the uncertainties that arise during the TMDL process. Offerors should be experienced in or have staff members with proper credentials to facilitate participation with local stakeholders.

TMDL Effectiveness Monitoring. Effectiveness monitoring will be required to evaluate the success of implementing a TMDL plan. Monitoring will often include the collection of some combination of chemical,

physical or biological data, which can be used to determine if water quality is improving over time. Most monitoring designs and techniques will be fairly straightforward and may only require visiting a site once per year. In most cases, the contractor will be required to write an annual report, which can be used to determine if water quality is improving.

Geographic Information Systems (GIS) Services. The State, and in particular DEQ, will need assessments that characterize a watershed and identify and quantify all probable sources of pollutants. GIS maps will be required for every waterbody that is assessed. Thematic maps may include, but are not limited to: land ownership, land use, topography, hydrology, soils, precipitation, and/or endangered species distribution. In addition, DEQ may request that GIS applications be used to facilitate the interpretation and analysis of digital images and/or other georeferenced data.

Remote Sensing. The State may consider the use of remote sensing for characterizing a watershed and identifying probable sources of pollutants. For example, indicator metrics may be calculated from an air photo. Metrics may include active channel width, Rosgen level 1 Channel types, % shade, % land use, % land cover, average flood plain width, riparian corridor fragmentation, road density, road crossings, length of irrigation ditch/area, etc. DEQ may request contractors to assist them in developing remote sensing assessment techniques or to employ developed techniques in conducting detailed assessments. All data must be entered into an approved database structure, format, or program and linkage to the National Hydrography Dataset (NHD) streams layer may be requested. If necessary, the Contractor can subcontract in order to acquire the aerial photography products. All subcontractors for this task must be approved by the State prior to initiating a contract.

Water Quality Modeling. The State, and in particular DEQ, uses contracted services in the development and/or application of watershed and water quality modeling tools and techniques in the development of TMDLs. Models may be used to assist in defining TMDL loading allocations, performing existing/potential conditions analysis, watershed scenario analysis, and/or standards attainment analysis. The types of models that may be employed include dynamic watershed loading models (i.e. SWAT, HSPF), water quality fate and transport models (i.e. QUAL2E, QUAL2K), stream temperature and/or shade models (i.e. SSTemp, HeatSource, Shadow), and multi-dimensional lake/reservoir models (i.e. CE QUAL W2). In addition, simpler modeling tools and techniques such as GIS-based Risk Assessment Modeling may be employed or developed based on project needs and resources. The DEQ may also seek assistance in the identification and/or development of simple modeling tools that may be implemented at the desktop that facilitate quick scenario applications. These tools should be able to focus on specific water quality issues such as sediment, nutrients, salinity, etc. and be tailored to the various (eco) regions across the state.

Statistical Analysis. The State may request that large data sets be statistically analyzed for determining trends or for making comparisons. This service area may include data compilation, organization, manipulation and analysis. These analyses may be used to validate environmental targets by comparing reference data to existing data. They may also be used to establish a relationship or linkage between indicators and targets, the estimated loads and how targets link to beneficial use support. Analyses should be appropriate for the type of data being analyzed. In many cases, the contractor will be responsible for determining and providing rationale for appropriate statistical analyses to address pre-formulated environmental hypotheses. Analyses must consider spatial and temporal variations. Analyses may range from providing simple descriptive statistics to reporting multifactor predictive analyses.

DEQ Electronic Data / Information Technical Assistance. The DEQ needs to be able to easily transmit water quality data into the modernized STORET database and make it more accessible to data consumers and the public. To accomplish this, the DEQ seeks to obtain technical products, services, and support, as needed, to migrate datasets to production database system(s) and improve data flow and data quality from a variety of sources into STORET. These tasks may include, but are not limited to solutions in commonly available software products to generate data that conforms to STORET and Oracle database requirements. Specific service areas sought include, but are not limited to: technical support for data conversion, reformatting, and/or normalization of existing historic and transformed datasets; automated data validation routines or procedures designed to support specific data quality objectives; technical solutions for data entry, data capture, and data reporting, maintenance, upgrades or enhancements to existing software

interfaces; technical support in the implementation of STORET; acquisition of STORET-compatible data deliverables.

Revegetation Services. Revegetation Specialists are utilized by the State and other governmental entities to enhance and complete environmental project tasks. The services offered by Revegetation Specialists are planning, designing, implementation along with providing of supplies, materials and equipment necessary to carryout the tasks. If a firm does not have the staff or equipment to implant a project, they must then be able to demonstrate a plan for delivery of product and implementation of a project through subcontracting or professional cooperative agreements.

Watershed Coordination. Within the State of Montana, there are over 50 active watershed groups that are comprised of local stakeholders working together for the efficient use and preservation of the natural resources. The watershed groups typically work with State and Federal agencies to complete agreed upon tasks. The funding for the activities is usually in the form of State and Federal grant funds in which the group must apply and compete for the awards. Therefore, the watershed groups either designate or hire a professional coordinator to research and secure funds, organize public meetings, facilitate the public meetings, represent the group at local, regional, state and even national conferences. The offeror's in this service area must make sure that they will not have a conflict of interest. The coordinator and/or their firm cannot compete for any projects or activities under the jurisdiction of the watershed group.

Communication/Education Services – Information Transfer & TMDL Technical Editing. Communication/education contractor specializing in information transfer would assist in the design, production and distribution of information for target audiences via TV, radio, or print media. These projects often require the conversion of complex water quality data into information the public can understand. Products include pamphlets, brochures, guidebooks, and videos; maintaining a webpage, writing press releases; set up public meetings, give interviews, make presentations at workshops and conferences and organize conferences and set up field trips. Offerors in this field may also specify their ability to provide Technical Editing of Natural Science documents, in particular Total Maximum Daily Load documents. Technical editing can include, but is not limited to proofreading for grammar and mathematical errors, document clarity, and linkage between different sections.

Land Use Planning Services. Land use planning services would include Agricultural Land Use, Watershed Land Use or any other land planning services to benefit the state or other governmental entity. The Land Use Planning efforts can include soil analysis, crop recommendations, and irrigation recommendations to assist in developing a beneficial plan for the land in question.

Preparation of Technical Manuals or Circulars. Regulatory programs require periodic preparation of technical materials to guide either public regulated entities or in-house staff in how to work through a regulatory requirement such as obtaining or writing a permit. These products require technical writing, document preparation, preparation of figures or tables, preparation and use of spreadsheets, research and assimilation of regulations, technical approaches to problem solving and explanation of approaches to prepare applications and/or actual permits.

8.2 Reuse of Documents. When the projects dictate a design or engineered approach, the State agrees that it will not apply the Contractor's designs to any other projects.

9. ENGINEERING ACCESS

All of the firms selected may need to have access to engineering services depending on the nature of the project. The contractor(s) will be expected to use their own best judgment as to whether engineering services are needed for a given project. However, traditional engineering methodologies are not the emphasis of this RFP. It is a violation of State Statute to practice engineering or land surveying without a license.

10. PROJECT SELECTION

10.1 Project Identification. The State will be responsible for identifying projects, contacting landowners and securing necessary permission/cooperation agreements, selecting a contractor, writing grant applications and approving project payments.

10.2 Hazardous Materials. The State will not initiate projects where it is known that hazardous materials are present. If there is an indication of a potential of hazardous materials, then the State will do testing prior to contacting the contractor. However, there is always the possibility of unforeseen problems resulting in the stoppage of a project.

10.3 Meetings. The selected contractor may be required to meet with State personnel at the project site to conduct a site evaluation, discuss project issues and begin the negotiation process on project feasibility, conceptual design and costs for each project.

10.4 Approach Expectations. In the case of restoration activities, the agency will identify the preferred techniques. The determination made by the State may define which contractor(s) are contacted for project initiation. The State is always open to new and innovative approaches that accomplish project goals.

11. SELECTING A CONTRACTOR

The State may select a term contract holder from the Environmental Services contract home page as provided under the state's website address

<http://www.discoveringmontana.com/doa/gsd/procurement/TermContracts/environservices/Default.asp>, taking into consideration such things as the contractor's area of expertise, requirements and location of the project, the contractor's availability and access to resources necessary to efficiently and effectively complete the project, demonstrated excellent past performance on State and public projects, identified subcontractors and total project cost.

General. Ordering agencies shall use the procedures in this section when ordering services priced at hourly rates as established by each Term Contract (TC). The applicable service categories are identified in each TC along with the contractor's price lists.

Request for Quotation (RFQ) procedures. The ordering agency must provide an RFQ, which includes the statement of work and limited, but specific evaluation criteria (e.g., experience and past performance), to TC contractors that offer services that will meet the agency's needs. The RFQ may be posted to the agency's state website to expedite responses.

Statement of Work (SOWs). All SOW's shall include at a minimum a detailed description of the work to be performed, location of work, period of performance, deliverable schedule, applicable performance standards and any special requirements (e.g., security clearances, travel, special knowledge).

- (1) Ordering agency may select a contractor from the appropriate service category and directly negotiate a mutually acceptable project based on a sudden and unexpected happening or unforeseen occurrence or condition, which requires immediate action. (Exigency).
- (2) Ordering agency may place orders at or below the \$5,000 threshold with any TC contractor that can meet the agency's needs. The ordering agency should attempt to distribute orders among all service category contractors.
- (3) For orders estimated to exceed \$5,000 but less than \$25,000.
 - (i) The ordering agency shall develop a statement of work.
 - (ii) The ordering agency shall provide the RFQ (including the statement of work and evaluation criteria) to at least three TC contractors that offer services that will meet the agency's needs.
 - (iii) The ordering agency shall request that contractors submit firm-fixed prices to perform the services identified in the statement of work.

(4) For orders estimated to exceed \$25,000. In addition to meeting the requirements of (3) above, the ordering agency shall:

- (i) Provide the RFQ (including the statement of work and the evaluation criteria) to a minimum of six service category TC contractors (if category has less than 6, all contractors will be offered an RFQ) with a 50% replacement factor for each subsequent request for quote in the same service category.

Evaluation. The ordering agency shall evaluate all responses received using the evaluation criteria provided in the RFQ to each TC contractor. The ordering agency is responsible for considering the level of effort and the mix of labor proposed to perform a specific task being ordered, and for determining that the total price is reasonable. The agency will place the order with the contractor that represents the best value. After award, ordering agencies will provide timely notification to unsuccessful TC contractors. If an unsuccessful TC contractor requests information on a task order award that was based on factors other than price alone, a brief explanation of the basis for the award decision shall be provided.

Minimum documentation. The ordering agency shall document:

- (1) The TC contractors considered, noting the contractor from which the service was purchased.
- (2) A description of the service purchased.
- (3) The amount paid.
- (4) The evaluation methodology used in selecting the contractor to receive the order.
- (5) The rationale for making the selection.
- (6) Determination of price fair and reasonableness.

Agency project task orders will be utilized to finalize the project. Only written addenda will be used for adjustments of the task orders and must be signed by both parties. All task orders must contain signatures from both parties and appropriate agency legal review as directed in their procurement policy.

The State will monitor contractor selection by using the information provided in the annual TC usage reports.

Contractor's who fail to respond to three RFQ opportunities within a one-year period between July 1st and June 30th may be removed from the qualified list of contractors.

12. CONTRACTOR RESPONSIBILITIES

12.1 Supervision and Implementation. The selected contractor for an individual project will be responsible for the supervision and implementation of the approach and will be responsible for oversight of work performed by all subcontractors. In most cases the contractor will provide and be responsible for all the necessary equipment, materials, supplies and personnel necessary for proper execution of the work. However, the State reserves the right to hire subcontractors (equipment and/or labor) if it will provide a cost savings to the State. The selected contractor will also be responsible for clean up of the sites if necessary and must have the sites inspected by the State immediately prior to completion.

12.2 On-Site Requirements. When a contractor is contacted by the State to discuss a project, the State and the contractor may visit the job site if deemed necessary by the Project Manager, to become familiar with conditions relating to the project and the labor requirements. The State will provide a detailed scope of work for the project and request the contractor supply the State with a response to project approach, cost, timeframe and any other information deemed necessary by the State to make a selection or complete a contract negotiation.

In the cases of Restoration or On-The-Ground Activities, the contractor shall adequately protect the work, adjacent property, and the public in all phases of the work. They shall be responsible for all damages or injury due to their action or neglect.

The contractor shall maintain access to all phases of the contract pending inspection by the State, the landowner, or their representative. All interim or final products funded by the contract will become the property of the State or Cooperative Purchaser upon payment for said products.

All work rejected as unsatisfactory shall be corrected prior to final inspection and acceptance. The contractor shall respond within seven calendar days after notice of observed defects has been given and shall proceed to immediately remedy these defects. Should the contractor fail to respond to the notice or not remedy the defects, the State may have the work corrected at the expense of the contractor.

12.3 Clean Up (when project tasks require). The contractor shall:

- Keep the premises free from debris and accumulation of waste;
- Clean up any oil or fuel spills;
- Keep machinery clean and free of weeds;
- Remove all construction equipment, tools and excess materials; and
- Perform finishing site preparation to limit the spread of noxious weeds before final payment by the State.

12.4 Applicable Laws. The contractor shall keep informed of, and shall comply with all applicable laws, ordinances, rules, regulations and orders of the City, County, State, Federal or public bodies having jurisdiction affecting any work to be done to provide the services required. The contractor shall provide all necessary safeguards for safety and protection, as set forth by the United States Department of Labor, Occupational Safety and Health Administration.

12.5 Cooperation. The contractor shall work closely with the States analytical consultants, (i.e. environmental laboratories and taxonomists) to develop the desired products.

12.6 Work Acceptance. The contractor is responsible for project oversight as needed. The State may also periodically provide personnel for administrative oversight from the initiation of the contract through project completion. All work will be inspected by the State or designated liaison prior to approval of any contract payments. All work rejected as unsatisfactory shall be corrected prior to final inspection and acceptance. Contractor shall respond within seven calendar days after notice of defects has been given by the State and proceed to immediately remedy all defects.

12.7 Records. The contractor will supply the State with documentation, when requested, of methods used throughout project implementation. Contractor will maintain records for themselves and all subcontractors of supplies, materials, equipment and labor hours expended.

12.8 Communication. Remoteness of project sites may necessitate that the contractor have some form of field communication such as a cellular phone. This communication is necessary to enable the State to respond to public concerns related to the project, accidents, inspections, or other project issues that require immediate feedback. In addition, the State or Cooperative Purchaser may require scheduled communication at agreed upon intervals. The communication schedule will be dependent upon the project circumstances and requirements of the contracting agency. In the case when a communication schedule is included in the Scope of Work, the schedule will commence when the contractor initiates the project.

12.9 Change of Staffing. Since qualifications of personnel were key in determining which offerors were selected to be on this TC, a written notification of any changes in key personnel must be made to the state agency, prior to entering into negotiations to perform any specific work scope. Contractor shall replace such employee(s) at its own expense with an employee of substantially equal abilities and qualifications without additional cost to the agency. If these staffing changes cause the contractor to no longer meet the qualifications stated herein, that firm will be removed from the service area of this TC. Failure to notify the state agency of staffing changes could result in the contractor being removed from the TC listing and possible suspension from bidding on other state projects.

12.10 Collaboration. The State encourages collaboration between contractors to increase the scope of services offered. In cases where the chosen contractor is not able to provide all services needed for the project, the State will expect the chosen contractor to contact other contractors on this list to negotiate subcontracts for these services before going elsewhere. Exceptions to this strategy will be evaluated on a case-by-case basis.

12.11 Subcontractors, Project Budget and Invoicing. All subcontractors to be used in any project must be approved by the authorized entity initiating the project. Project budgets will be negotiated for each individual project contract. However, all rates, terms and conditions set forth in this term contract will be applied to individual contracts. Subcontractor is defined as anyone other than the prime contractor having substantial direct involvement in a specific project.

The State reserves the right to choose the invoicing method from the following:

- Prime contractor's billing will include the subcontractors charges and payment will be made to the prime, or
- Prime and subcontractors will bill the State separately and the State will pay each directly.

13. CONSIDERATION/PAYMENT

13.1 Payment Schedule. In consideration for the services to be provided, the State shall pay according to the negotiated agreement for each project. Hourly rates and miscellaneous charges as provided in Attachment B shall apply.

13.2 Withholding of Payment. The State may withhold payments to the Contractor if the Contractor has not performed in accordance with this contract. Such withholding cannot be greater than the additional costs to the State caused by the lack of performance.

14. CONTRACTOR REGISTRATION

The Contractor will be registered with the Department of Labor and Industry under sections 39-9-201 and 39-9-204, MCA, *prior* to contract execution. The State cannot execute a contract for construction to a Contractor who is not registered. (Mont. Code Ann. § 39-9-401.)

Contractor Registration Number: 149431

15. CONTRACTOR WITHHOLDING

Section 15-50-206, MCA, requires the state agency or department for whom a public works construction contract over \$5,000 is being performed, to withhold 1 percent of all payments and to transmit such monies to the Department of Revenue.

16. MONTANA PREVAILING WAGE REQUIREMENTS

Unless superseded by federal law, Montana law requires that contractors and subcontractors give preference to the employment of Montana residents for any public works contract in excess of \$25,000 for construction or nonconstruction services in accordance with sections 18-2-401 through 18-2-432, MCA, and all administrative rules adopted pursuant thereto. Unless superseded by federal law, at least 50% of the workers of each contractor engaged in construction services must be performed by bona fide Montana residents. The Commissioner of the Montana Department of Labor and Industry has established the resident requirements in accordance with sections 18-2-403 and 18-2-409, MCA. Any and all questions concerning prevailing wage and Montana resident issues should be directed to the Montana Department of Labor and Industry.

In addition, unless superseded by federal law, all employees working on a public works contract shall be paid prevailing wage rates in accordance with sections 18-2-401 through 18-2-432, MCA, and all administrative rules adopted pursuant thereto. Montana law requires that all public works contracts, as defined in section 18-2-401, MCA, in which the total cost of the contract is in excess of \$25,000, contain a provision stating for each job classification the standard prevailing wage rate, including fringe benefits, travel, per diem, and zone pay that the contractors, subcontractors, and employers shall pay during the public works contract.

Furthermore, section 18-2-406, MCA, requires that all contractors, subcontractors, and employers who are performing work or providing services under a public works contract post in a prominent and accessible site on the project staging area or work area, no later than the first day of work and continuing for the entire duration of the contract, a legible statement of all wages and fringe benefits to be paid to the employees in compliance

with section 18-2-423, MCA. Section 18-2-423, MCA, requires that employees receiving an hourly wage must be paid on a weekly basis.

Each contractor, subcontractor, and employer must maintain payroll records in a manner readily capable of being certified for submission under section 18-2-423, MCA, for not less than three years after the contractor's, subcontractor's, or employer's completion of work on the public works contract.

The nature of the work performed or services provided under this contract meets the statutory definition of a "public works contract" under section 18-2-401(11)(a), MCA, and falls under the category of Heavy Construction and Nonconstruction services. The booklets containing Montana's 2003 Rates for Nonconstruction Services **and 2004 Rates for Heavy Construction** are attached.

The most current Montana Prevailing Wage Booklet will automatically be incorporated at time of renewal. It is the contractor's responsibility to ensure they are using the most current prevailing wages during performance of its covered work.

17. ACCESS AND RETENTION OF RECORDS

17.1 Access to Records. The Contractor agrees to provide the State, Legislative Auditor or their authorized agents access to any records necessary to determine contract compliance. (Mont. Code Ann. § 18-1-118.)

17.2 Retention Period. The Contractor agrees to create and retain records supporting the environmental services for a period of three years after either the completion date of this contract or the conclusion of any claim, litigation or exception relating to this contract taken by the State of Montana or a third party.

18. ASSIGNMENT, TRANSFER AND SUBCONTRACTING

The Contractor shall not assign, transfer or subcontract any portion of this contract without the express written consent of the State. (Mont. Code Ann. § 18-4-141.) The Contractor shall be responsible to the State for the acts and omissions of all subcontractors or agents and of persons directly or indirectly employed by such subcontractors, and for the acts and omissions of persons employed directly by the Contractor. No contractual relationships exist between any subcontractor and the State.

19. HOLD HARMLESS/INDEMNIFICATION

The Contractor agrees to protect, defend, and save the State, its elected and appointed officials, agents, and employees, while acting within the scope of their duties as such, harmless from and against all claims, demands, causes of action of any kind or character, including the cost of defense thereof, arising in favor of the Contractor's employees or third parties on account of bodily or personal injuries, death, or damage to property arising out of services performed or omissions of services or in any way resulting from the acts or omissions of the Contractor and/or its agents, employees, representatives, assigns, subcontractors, except the sole negligence of the State, under this agreement.

20. REQUIRED INSURANCE

20.1 General Requirements. The Contractor shall maintain for the duration of the contract, at its cost and expense, insurance against claims for injuries to persons or damages to property, including contractual liability, which may arise from or in connection with the performance of the work by the Contractor, agents, employees, representatives, assigns, or subcontractors. This insurance shall cover such claims as may be caused by any negligent act or omission.

20.2 Primary Insurance. The Contractor's insurance coverage shall be primary insurance as respect to the State, its officers, officials, employees, and volunteers and shall apply separately to each project or location. Any insurance or self-insurance maintained by the State, its officers, officials, employees or volunteers shall be excess of the Contractor's insurance and shall not contribute with it.

20.3 Specific Requirements for Commercial General Liability. The Contractor shall purchase and maintain occurrence coverage with combined single limits for bodily injury, personal injury, and property damage of \$1,000,000 per occurrence and \$2,000,000 aggregate per year to cover such claims as may be caused by any act, omission, or negligence of the Contractor or its officers, agents, representatives, assigns or subcontractors.

20.4 Additional Insured Status. The State, its officers, officials, employees, and volunteers are to be covered and listed as additional insureds; for liability arising out of activities performed by or on behalf of the Contractor, including the insured's general supervision of the Contractor; products and completed operations; premises owned, leased, occupied, or used.

20.5 Specific Requirements for Automobile Liability. The Contractor shall purchase and maintain coverage with split limits of \$500,000 per person (personal injury), \$1,000,000 per accident occurrence (personal injury), and \$100,000 per accident occurrence (property damage), OR combined single limits of \$1,000,000 per occurrence to cover such claims as may be caused by any act, omission, or negligence of the contractor or its officers, agents, representatives, assigns or subcontractors.

20.6 Additional Insured Status. The State, its officers, officials, employees, and volunteers are to be covered and listed as additional insureds for automobiles leased, hired, or borrowed by the Contractor.

20.7 Specific Requirements for Professional Liability. The Contractor shall purchase and maintain occurrence coverage with combined single limits for each wrongful act of \$1,000,000 per occurrence and \$2,000,000 aggregate per year to cover such claims as may be caused by any act, omission, negligence of the Contractor or its officers, agents, representatives, assigns or subcontractors. Note: if "occurrence" coverage is unavailable or cost prohibitive, the Contractor may provide "claims made" coverage provided the following conditions are met: (1) the commencement date of the contract must not fall outside the effective date of insurance coverage and it will be the retroactive date for insurance coverage in future years; and (2) the claims made policy must have a three year tail for claims that are made (filed) after the cancellation or expiration date of the policy.

20.8 Deductibles and Self-Insured Retentions. Any deductible or self-insured retention must be declared to and approved by the state agency. At the request of the agency either: (1) the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the State, its officers, officials, employees, or volunteers; or (2) at the expense of the Contractor, the Contractor shall procure a bond guaranteeing payment of losses and related investigations, claims administration, and defense expenses.

20.9 Certificate of Insurance/Endorsements. A certificate of insurance from an insurer with a Best's rating of no less than A- indicating compliance with the required coverages, has been received by the State Procurement Bureau, PO Box 200135, Helena MT 59620-0135. The Contractor must notify the State immediately, of any material change in insurance coverage, such as changes in limits, coverages, change in status of policy, etc. The State reserves the right to require complete copies of insurance policies at all times.

21. COMPLIANCE WITH THE WORKERS' COMPENSATION ACT

Contractors are required to comply with the provisions of the Montana Workers' Compensation Act while performing work for the State of Montana in accordance with sections 39-71-120, 39-71-401, and 39-71-405, MCA. Proof of compliance must be in the form of workers' compensation insurance, an independent contractor's exemption, or documentation of corporate officer status. Neither the contractor nor its employees are employees of the State. This insurance/exemption must be valid for the entire term of the contract. A renewal document must be sent to the State Procurement Bureau, PO Box 200135, Helena MT 59620-0135, upon expiration.

22. COMPLIANCE WITH LAWS

The Contractor must, in performance of work under this contract, fully comply with all applicable federal, state, or local laws, rules and regulations, including the Montana Human Rights Act, the Civil Rights Act of 1964, the Age Discrimination Act of 1975, the Americans with Disabilities Act of 1990, and Section 504 of the

Rehabilitation Act of 1973. Any subletting or subcontracting by the Contractor subjects subcontractors to the same provision. In accordance with section 49-3-207, MCA, the Contractor agrees that the hiring of persons to perform the contract will be made on the basis of merit and qualifications and there will be no discrimination based upon race, color, religion, creed, political ideas, sex, age, marital status, physical or mental disability, or national origin by the persons performing the contract.

23. INTELLECTUAL PROPERTY

All patent and other legal rights in or to inventions created in whole or in part under this contract must be available to the State for royalty-free and nonexclusive licensing. Both parties shall have a royalty-free, nonexclusive, and irrevocable right to reproduce, publish or otherwise use and authorize others to use, copyrightable property created under this contract.

24. PATENT AND COPYRIGHT PROTECTION

24.1 Third Party Claim. In the event of any claim by any third party against the State that the products furnished under this contract infringe upon or violate any patent or copyright, the State shall promptly notify Contractor. Contractor shall defend such claim, in the State's name or its own name, as appropriate, but at Contractor's expense. Contractor will indemnify the State against all costs, damages and attorney's fees that accrue as a result of such claim. If the State reasonably concludes that its interests are not being properly protected, or if principles of governmental or public law are involved, it may enter any action.

24.2 Product Subject of Claim. If any product furnished is likely to or does become the subject of a claim of infringement of a patent or copyright, then Contractor may, at its option, procure for the State the right to continue using the alleged infringing product, or modify the product so that it becomes non-infringing. If none of the above options can be accomplished, or if the use of such product by the State shall be prevented by injunction, the State will determine if the Contract has been breached.

25. CONTRACT TERMINATION

25.1 Termination for Cause. The State may, by written notice to the Contractor, terminate this contract in whole or in part at any time the Contractor fails to perform this contract.

25.2 Reduction of Funding. The State, at its sole discretion, may terminate or reduce the scope of this contract if available funding is reduced for any reason. (See Mont. Code Ann. § 18-4-313(3).)

26. STATE PERSONNEL

26.1 State Contract Manager. The State Contract Manager identified below is the State's single point of contact and will perform all contract management pursuant to section 2-17-512, MCA, on behalf of the State. Written notices, requests, complaints or any other issues regarding the contract should be directed to the State Contract Manager.

The State Contract Manager for this contract is:

Robert Oliver, Contracts Officer
Room 165 Mitchell Building
125 North Roberts
PO Box 200135
Helena MT 59620-0135
Telephone #: (406) 444-0110
Fax #: (406) 444-2529
E-mail: roliver@mt.gov

26.2 State Project Manager. Each using State agency or Cooperative Purchaser will identify a Project Manager in the project task order. The Project Manager will manage the day-to-day project activities on behalf of the State/Cooperative Purchaser.

27. CONTRACTOR PERSONNEL

27.1 Change Of Staffing. Since qualifications of personnel was key in determining which offerors were selected to be on this term contract list, a written notification to the State Procurement Bureau of any changes of key personnel must be made within two weeks of the change. These change notifications will be completed upon the departure or hiring of key personnel who are professional employees critical to awarded service areas. If these staffing changes cause the firm to no longer meet the qualifications stated herein, that firm will be removed from the service area of this term contract. Failure to notify the State Procurement Bureau of staffing changes could result in the contractor being removed from the term contract listing and possible suspension from bidding on other State projects.

27.2 Contractor Contract Manager. The Contractor Contract Manager identified below will be the single point of contact to the State Contract Manager and will assume responsibility for the coordination of all contract issues under this contract. The Contractor Contract Manager will meet with the State Contract Manager and/or others necessary to resolve any conflicts, disagreements, or other contract issues.

The Contractor Contract Manager for this contract is:

J. Edward Surbrugg
7 West 6th Ave Suite 612
Helena MT 59601
Telephone #: (406) 442-5588
Fax #: (406) 442-7182
E-mail: eward.surbrugg@ttemi.com

27.3 Contractor Project Manager. The Contractor Project Manager identified below will manage the day-to-day project activities on behalf of the Contractor:

The Contractor Project Manager for this contract is:

Alice Stanley
7 West 6th Ave Suite 612
Helena MT 59601
Telephone #: (406) 442-5588
Fax #: (406) 442-7182
E-mail: alice.Stanley@ttemi.com

28. MEETINGS

The Contractor is required to meet with the State's personnel, or designated representatives, to resolve technical or contractual problems that may occur during the term of the contract or to discuss the progress made by Contractor and the State in the performance of their respective obligations, at no additional cost to the State. Meetings will occur as problems arise and will be coordinated by the State. The Contractor will be given a minimum of three full working days notice of meeting date, time, and location. Face-to-face meetings are desired. However, at the Contractor's option and expense, a conference call meeting may be substituted. Consistent failure to participate in problem resolution meetings two consecutive missed or rescheduled meetings, or to make a good faith effort to resolve problems, may result in termination of the contract.

29. CONTRACTOR PERFORMANCE ASSESSMENTS

The State may do assessments of the Contractor's performance. This contract may be terminated for one or more poor performance assessments. Contractors will have the opportunity to respond to poor performance assessments. The State will make any final decision to terminate this contract based on the assessment and any related information, the Contractor's response and the severity of any negative performance assessment. The Contractor will be notified with a justification of contract termination. Performance assessments may be considered in future solicitations.

30. TRANSITION ASSISTANCE

If this contract is not renewed at the end of this term, or is terminated prior to the completion of a project, or if the work on a project is terminated, for any reason, the Contractor must provide for a reasonable period of time after the expiration or termination of this project or contract, all reasonable transition assistance requested by the State, to allow for the expired or terminated portion of the services to continue without interruption or adverse effect, and to facilitate the orderly transfer of such services to the State or its designees. Such transition assistance will be deemed by the parties to be governed by the terms and conditions of this contract, except for those terms or conditions that do not reasonably apply to such transition assistance. The State shall pay the Contractor for any resources utilized in performing such transition assistance at the most current rates provided by the contract. If there are no established contract rates, then the rate shall be mutually agreed upon. If the State terminates a project or this contract for cause, then the State will be entitled to offset the cost of paying the Contractor for the additional resources the Contractor utilized in providing transition assistance with any damages the State may have otherwise accrued as a result of said termination.

31. CHOICE OF LAW AND VENUE

This contract is governed by the laws of Montana. The parties agree that any litigation concerning this bid, proposal or subsequent contract must be brought in the First Judicial District in and for the County of Lewis and Clark, State of Montana and each party shall pay its own costs and attorney fees. (See Mont. Code Ann. § 18-1-401.)

32. SCOPE, AMENDMENT AND INTERPRETATION

32.1 Contract. This contract consists of 12 numbered pages, any Attachments as required, RFP # SPB05-894P, as amended and the Contractor's RFP response as amended. In the case of dispute or ambiguity about the minimum levels of performance by the Contractor the order of precedence of document interpretation is in the same order.

32.2 Entire Agreement. These documents contain the entire agreement of the parties. Any enlargement, alteration or modification requires a written amendment signed by both parties.

33. EXECUTION

The parties through their authorized agents have executed this contract on the dates set out below.

DEPARTMENT OF ADMINISTRATION
STATE PROCUREMENT BUREAU
PO BOX 200135
HELENA MT 59620-0135

TETRA TECH EM, INC.
7 WEST 6TH AVENUE, SUITE 612
HELENA MT 59601
FEDERAL ID # 62-1080561

BY: _____
Penny Moon, Contracts Officer

BY: _____
(Name/Title)

BY: _____
(Signature)

BY: _____
(Signature)

DATE: _____

DATE: _____

ATTACHMENT A CONTRACTOR'S RESPONSE

INTRODUCTION

Tetra Tech, EM Inc. (TtEMI) has prepared this proposal in response to the Montana State Department of Administration request for proposal (RFP) No. SPB05-894P. The RFP seeks contractors to assist state agencies with water quality monitoring and assessment of Montana's surface water, Total Maximum Daily Load (TMDL) technical services, and public participation and education. The intent of this contracting process is to establish a list of environmental service providers for various state agencies in several service areas. This proposal includes all required elements listed in the RFP and is organized in the same format as the RFP. For the most part, our responses to statements in the RFP are followed with a simple compliance statement. Section 4 provides descriptions of our project team, project team qualifications and references, and additional information requested in the RFP.

Our proposal also includes compliance statements for standard terms and conditions (Appendix A) and the contract (Appendix B). Appendix C provides a table listing our proposed service areas, and completed price sheets are provided in Appendix D.

TtEMI understands that the State anticipates the potential need for engineering services in support of activities conducted under this contract. Our project team includes engineers licensed as Professional Engineers in the State of Montana and a brief statement of qualifications for engineering services is included in Appendix E. Resumes for key project personnel and support staff are in Appendix F.

AVALANCHE CREEK — GLACIER PARK, MONTANA

4.0 STATE'S RIGHTS TO INVESTIGATE AND REJECT

TtEMI understands and will comply.

4.1 OFFEROR INFORMATIONAL REQUIREMENTS – ALL SERVICE CATEGORIES

TtEMI understands and will comply.

Project Understanding

The Montana Department of Administration is seeking to contract with one or more environmental and engineering firms to provide a range of environmental consulting services. The goal of the Department of Administration is to assemble a list of contractors for use by state agencies and other public procurement units.

Information Relevant to All Service Categories

TtEMI has assembled a project team and prepared this proposal to provide environmental and engineering consulting services for Montana State agencies in the service areas listed in Appendix C and as discussed in Sections 4.2.1 through 4.2.23.

Section 4.1.1 provides references for work completed by members of our project team. Section 4.1.2 provides a description of TtEMI and corporate experience. A detailed description of an ongoing watershed assessment and planning project conducted by members of our proposed project team is provided in Section 4.1.3, and a summary of staff team qualifications for proposed services is provided in Section 4.1.4.

4.1.1 References

TtEMI understands and will comply.

TtEMI is a recognized leader in the fields of water quality assessment, watershed management, and natural resources management. Our client base spans virtually every federal agency involved in water resource management; most Montana state water programs; and a variety of municipalities, counties and regional planning agencies facing complex water management problems. The services provided to these clients range from watershed-based studies to restoration services to public participation and education.

Table 2 provides 9 references of clients that have used or are using our services in the areas listed in Appendix C. All references contain requested contact and project description information. Our project team members pride themselves on meeting or exceeding client expectations with every project and encourage proposal reviewers to contact clients for their comments.

4.1.2 Company Profile and Experience

TtEMI understands and will comply.

The Helena office of TtEMI was started in 1989 to provide local support to the U.S. Environmental Protection Agency (EPA) Region 8. Since then, our office has diversified to meet the specific needs of clients in the Pacific Northwest and Rocky Mountains region. In 15 years, the number of TtEMI staff in Helena has increased to 30 environmental professionals and support personnel working on a variety of local and national projects. Project descriptions highlighting TtEMI's expertise applicable to the requested services in RFP No. SPB05-894P are provided in Table 3. General qualification descriptions for the Helena office are provided in Appendix E.

TtEMI is a publicly owned, full-service environmental engineering firm that provides comprehensive engineering and consulting services, with a focus on water resources and environmental protection. TtEMI is a division of Tetra Tech, Inc, one of the largest and most successful engineering-consulting firms in the United States, with over 8,000 employees in more than 150 offices, and annual revenue of \$1 billion. Our clients include a diverse base of public and private organizations in the United States and overseas. TtEMI possesses unmatched experience in watershed assessment services. We have worked with the EPA at the headquarters and regional levels for more than 20 years and have assisted the Helena EPA office in implementing part of its Montana-related TMDL tasks.

TtEMI has completed countless projects involving watershed assessments, complex watershed modeling, and the design of management programs to address point and nonpoint source impairments. Our proposed project team includes scientists and engineers proficient in all aspects of watershed analysis, surface and groundwater monitoring and TMDL support services. Examples of relevant project experience are provided in Table 3.

Project Team Qualifications

This section highlights the professional qualifications of our proposed team. We have selected a team of key and support personnel with the education, training, and experience needed to ensure that all the needs of this contract are met. An organizational chart of proposed team members is provided in **Figure 1**. **Figure 2** summarizes personnel qualifications for all team members identified in this proposal. Detailed project experience and relevant professional training is described in individual resumes located in **Appendix F**.

A summary of relevant team member expertise is also provided under each proposed service in Section 4.2.

TABLE 2
PROJECT REFERENCES
TtEMI PROJECT TEAM

Applicable Services Areas:	Service Area 1— Water Quality Monitoring: Fixed Station and Probabilistic Design Service Area 2 — Water Quality Monitoring: Lakes and Streams Service Area 3 — Water Quality Monitoring: Reference Sites Service Area 4 — TMDL Targets Service Area 5 — TMDL Source Assessment/Delineation Service Area 6 — TMDL Load Allocations Service Area 7 — Total Maximum Daily Loads Service Area 8 — Stakeholder Participation Service Area 9 — TMDL Effectiveness Monitoring Service Area 10 — GIS Services Service Area 12 — Water Quality Modeling Service Area 13 — Statistical Analysis Service Area 18 — Watershed Coordination
Project:	Development of TMDL for Pearl Harbor, Oahu, Hawaii and Nawiliwili Bay, Kauai, Hawaii
Client:	State of Hawaii Department of Health (HDOH) Environmental Planning Office 919 Ala Moana Blvd., Room 312 Honolulu, HI 96814
Client Contact:	June Harrigan, David Penn (808) 586-4338
Location:	Nawiliwili Bay, Kauai and Pearl Harbor, Oahu, Hawaii
Dates of Service:	June 2002 – December 2005
Project Description: TtEMI is currently implementing a full-scale TMDL approach for the Pearl Harbor watershed that includes the following components: data collection and monitoring plans, data management and geographic information systems (GIS), watershed characterization, watershed modeling, estuary modeling, control action implementation planning and feasibility analysis, TMDL report preparation, and public outreach and community involvement. TtEMI has conducted an exhaustive investigation and review of EPA's databases to identify specific contaminant sources in the Pearl Harbor watershed. TtEMI is compiling and summarizing the data collected into both a watershed characterization and a TMDL report. TtEMI has identified the major contaminant sources from the upper watershed, which include agricultural users, commercial users, industrial point source dischargers, storm-water lines, unlined and lined culverts, and residential and commercial point and nonpoint dischargers. For the Nawiliwili Bay TMDL study, TtEMI devised an innovative, cost-saving sampling scheme that relies on storm triggered automatic samplers to collect data on contaminants in storm-water runoff. This system allows the simultaneous sampling of runoff at seven critical and remote points along the watershed under unpredictable weather conditions. Using sampling data from the seven stream locations and two estuary locations, TtEMI is assisting with computer modeling to evaluate contaminant loading from the entire watershed to Nawiliwili Bay. The modeling results will be used to identify contaminant source reduction goals for major upland landowners that may be contributing to contamination in the streams and bay. In addition, TtEMI has prepared the Nawiliwili Bay watershed characterization report, which includes a stream assessment, description of hydraulic flow conditions, and invasive species evaluation. Side by side with HDOH, TtEMI conducted a series of outreach meetings with stakeholders in the watershed, including commercial developers and landowners, agricultural users, City Planning Department staff, federal resource management agencies, and research and environmental groups.	

TABLE 2 (Continued)

PROJECT REFERENCES
TtEMI PROJECT TEAM

Applicable Services Areas: Service Area 1 — Water Quality Monitoring: Fixed Station and Probabilistic Design Service Area 2 — Water Quality Monitoring: Lakes and Streams Service Area 3 — Water Quality Monitoring: Reference Sites Service Area 10 — GIS Services Service Area 13 — Statistical Analysis	
Project:	Watershed Monitoring
Client:	Naval Air Station Point Mugu Environmental Department
Client Contact:	Steve Granade (805) 989-3806
Location:	Calleguas Creek, Naval Air Station Point Mugu, California
Dates of Service:	1997-present
Project Description: TtEMI is performing a watershed investigation for the U.S. Navy at Naval Base Ventura County, Point Mugu. The watershed study is being performed on the 303(d) listed Calleguas Creek, in southern California. Calleguas Creek flows through NAS Point Mugu into the Mugu Lagoon that is the receiving water for the entire watershed. TtEMI is currently evaluating sediment loading in Calleguas Creek. TtEMI has established a fixed monitoring station in Calleguas Creek similar to a station located upstream and operated by the USGS. In addition, TtEMI has identified two other sampling stations upstream of the fixed station. Surface water samples are collected at the same time as at the fixed monitoring station. The samples are analyzed for metals, pesticides, and water quality parameters in order to assess chemical concentrations in the creek and potential source areas. All of the data is stored in the project GIS so that land use and risk assessment analysis can be performed.	
Applicable Services Areas: Service Area 1 — Fixed Station Water Quality Monitoring Design Service Area 2 — Water Quality Monitoring: Lakes and Streams Service Area 12 — Water Quality Modeling	
Project:	Development and Implementation of a Surface Water Monitoring Plan
Client:	Design and Construction, Fish, Wildlife and Parks P.O. Box 200701 Helena, MT 59620-0701
Client Contact:	Paul Valle, Landscape Architect (406) 841-4013
Location:	Freezout Lake; Fairfield, Montana
Dates of Service:	1997
Project Description: TtEMI developed a surface water monitoring plan to assess the Freezout Lake Wildlife Management Area (WMA). The project included developing and sampling at over 20 surface water flow monitoring sites for the Montana Department of Fish, Wildlife, and Parks. The purpose of this plan was to maximize the use of available water to provide and improve waterfowl production, staging, and resting habitat; and to minimize the impact of WMA discharges on the water quality of the Teton River. TtEMI summarized the existing water management practices, collected additional flow and water quality data, and developed a calibrated water balance model for the WMA. The water balance model was capable of evaluating a wide range of management decisions under wet, normal, and dry climatic conditions, and formed the basis for comparison of alternatives.	

TABLE 2 (Continued)
PROJECT REFERENCES
TtEMI PROJECT TEAM

Applicable Services Areas: Service Area 5 — Source Assessment and Delineation Service Area 10 — Geographic Information Services	
Project:	Montana Department of Transportation Source Water Protection
Client:	Montana Department of Transportation 2701 Prospect Avenue P.O. Box 201001 Helena, Montana 59620
Client Contact:	Stan Sternberg, Hazardous Waste Bureau Chief (406) 444-7647
Location:	Rest areas and springs throughout Montana
Dates of Service:	1999 – 2000
Project Description: TtEMI implemented and completed 40 source water delineation, inventory, and susceptibility assessment reports at rest areas and springs throughout Montana. The source water delineation and assessment reports were designed to satisfy the requirements of the Montana Department of Environmental Quality (DEQ) Source Water Protection Program (SWPP). The 1996 amendments to the 1986 Safe Drinking Water Act requires states to develop and implement a SWPP to assess existing and potential threats to public water supplies. GIS maps were created to accompany each SWPP report. The maps illustrated source water wellhead location, rest area location and proximity of these locations to river reaches. Locations were displayed on a scale of 1:24,000 along with the 1999 USGS National Landcover 90 meter resolution data set. Data was compiled for the existing 1 mile wide by 10 mile long river corridor in the inventory region. Point source pollution and septic density were then analyzed in reference to these inventory regions.	
Applicable Services Area: Service Area 10 — Geographic Information Services	
Project:	ArcView for ArcGIS Training
Client:	Montana Department of Environmental Quality Air Resources Management Bureau 1100 North Last Chance Gulch P.O. Box 200902 Helena, MT 59620-0902
Client Contact:	John Coefield (406) 444-5272
Location:	Montana Department of Environmental Quality offices Phoenix and Metcalf buildings, Helena, Montana
Dates of Service:	April-September 2003
Project Description: TtEMI recently prepared and taught two 2 ½-day courses utilizing air quality data in ArcView for ArcGIS 8.3. The first course, the Environmental Systems Research Institute (ESRI) authorized <i>Introduction to ArcGIS / for ArcGis 8X</i> was provided in May of 2003 to 15 students from the Air Resources Management Bureau. The second course, a custom designed course produced by TtEMI Advanced Techniques for ArcView for ArcGIS was provided to ten students in early September 2003.	

TABLE 2 (Continued)
PROJECT REFERENCES
TtEMI PROJECT TEAM

Applicable Services Areas: Service Area 11 — Remote Sensing Service Area 17 — Revegetation Services Service Area 22 — Land Use Planning	
Project:	Abandoned Mine Site
Client:	Montana Bureau of Land Management Butte, Montana Field Office
Client Contact:	Mike Browne (406) 533-7607
Location:	BLM-Owned Lands in Montana, North Dakota, and South Dakota
Dates of Service:	February 1999 through June 2004
Project Description: TtEMI currently provides the Montana Bureau of Land Management with abandoned mine reclamation design services in Montana, North Dakota, and South Dakota. To date, work has been performed under six delivery orders and consisted of site characterization, chemical sampling and analysis, human and ecological risk assessments, cultural resource investigations, mine claim and property ownership determinations, preparation of investigation reports and engineering evaluations/cost analysis documents, preparation of reclamation and revegetation plans, engineering project designs and plans and specifications, and reclamation project construction oversight. As part of the sampling and investigations, aerial photography, remote sensing, surveying, and site mapping services were completed. Abandoned mine reclamation activities have been completed at the Lower Indian Creek, Rochester Creek, and Nez Perce Creek Drainage in Montana. In addition, TtEMI compiled and prepared over 50 engineering technical specifications to specifically address abandoned mine reclamation construction activities at hard-rock and placer mine sites in the Rocky Mountain region.	
Applicable Services Areas: Service Area 8 — Stakeholder Participation Service Area 10 — Geographic Information Systems Service Area 11 — Remote Sensing Service Area 22 — Land Use Planning Service Area 23 — Technical Manuals or Circulars	
Project:	Development of a Resource Management Plan for the U.S. Bureau of Land Management Butte Field Office Planning Area
Client:	Butte Field Office Bureau of Land Management 106 North Parkmont Butte, MT 59701
Client Contact:	Ruth Miller, Project Manager (406) 533-7645
Location:	West Central Montana
Dates of Service:	2003 to Present
Project Description: TtEMI has teamed with three Tetra Tech sister companies to develop a Resource Management Plan (RMP) and Environmental Impact Statement (EIS) for the Bureau of Land Management (BLM) Butte Field Office. Responsibilities of the TtEMI Helena office include coordination with agency resource specialists and cooperating agencies, data collection, development of an analysis of the current management situation, inventory of existing resource conditions, preparation of an RMP; management of a 25-member EIS interdisciplinary team; issue identification; public relations activities; baseline data collection; alternatives and mitigation measures development; EIS preparation; and assisting the agency with public response activities. TtEMI has assisted the BLM in developing and implementing a public participation strategy for the land use planning process. This has included developing a public participation plan; organizing and assisting in six public scoping meetings; preparing and distributing press releases; producing an informational brochure; preparing presentation materials and posters; and assisting in developing a project website. TtEMI also prepared a scoping summary report.	

TABLE 2 (Continued)
PROJECT REFERENCES
TtEMI PROJECT TEAM

Applicable Services Areas: Service Area 8 — Stakeholder Participation Service Area 18 — Watershed Coordination Service Area 21 — Communication/Educational Services, Information Transfer & TMDL Technical Editing Service Area 23 — Preparation of Technical Manuals of Circulars	
Project:	Public Relations Support for the Environmental Impact Statement Proposed Withdrawal of the Limestone Hills Training Area
Client:	Montana Army National Guard P.O. Box 4789 Helena, MT 59604-4789
Client Contact:	Sundi West (406) 324-3088
Location:	Helena and Townsend, Montana
Dates of Service:	2002 to Present
Project Description: TtEMI developed and is currently implementing a public relations strategy for the proposed withdrawal of the Limestone Hills Training Area (LHTA), near Townsend, Montana. This has included developing a comprehensive public relations plan; organizing and assisting in a series of public meetings; preparing and distributing press releases and advertisements for radio and print media; designing, producing and distributing informational brochures; preparing presentation materials and posters; organizing and assisting in an Open House of the LHTA; and facilitating stakeholder working group meetings. TtEMI also developed a project website. Many of the materials that TtEMI developed for public information purposes can be reviewed at this project website at www.limestonehillswithdrawal.com .	
Applicable Services Area: Service Area 15 — DEQ Electronic Data/Information Technical	
Project:	Analytical Database Development and Management
Client:	Montana Department of Environmental Quality
Client Contact:	Catherine LeCours (406) 841-5040
Location:	Lockwood Solvent Site, Billings, MT
Dates of Service:	2001-Present
Project Description: TtEMI developed and is currently managing a database compatible to all of the client's prerequisites. In addition to managing data generated by TtEMI's field work historical data was cleaned up and imported into the newly developed database. Electronic analytical data continue to be imported into the database. In support of the ongoing CECRA activities at the site, Excel, Access, and Crystal Reports are being used for data analysis and reporting. The data is warehoused in SQL Server, (over 50), GIS figures are linked to this data, custom queries have been created for report use, and periodic "data snapshots" of the entire database in Access file format are generated for the client and end users.	

TABLE 3 TtEMI PROJECT TEAM RELEVANT PROJECT EXPERIENCE

Project Description	Project Team Member
<p>Powder /Tongue Rivers Rosebud Creek TMDL, US EPA. TtEMI conducted TMDL sampling in the Powder and Tongue River drainage basins during the summer of 2003 at USGS gauging stations. The TMDL sampling was performed as a baseline study of the drainage basins in preparation of potential future impacts from coal-bed methane development. Monthly sampling events were performed from April through September thereby encompassing seasonal flow variations. Work included collecting field water quality parameters, performing flow monitoring with Marsh-McBirney digital flow meters in full channel transects and collected laboratory samples at each station. Field parameters that were collected included pH, dissolved oxygen, salinity, total dissolved solids and turbidity. Laboratory analysis included common ions, metals, chlorophyll-A, soluble reactive phosphorus and surface water geochemistry parameters. Temperature data loggers were also deployed at 7 stations to develop a database of water temperature on a full-time basis through the field season. Sampling was performed at USGS gauging stations as well as temporary point locations throughout the basins.</p>	<p align="center">Joe Faubion</p>
<p>Development of TMDL for Pearl Harbor, Oahu, Hawaii. For the Pearl Harbor watershed, TtEMI is implementing a full-scale TMDL approach that includes the following components: data collection and monitoring plans, data management and geographic information systems (GIS), watershed characterization, watershed modeling, estuary modeling, control action implementation planning and feasibility analysis, TMDL report preparation, and public outreach and community involvement. TtEMI has conducted an exhaustive investigation and review of EPA's databases to identify specific contaminant sources in the Pearl Harbor watershed. TtEMI is compiling and summarizing the data collected into both a watershed characterization and a TMDL report. TtEMI has identified the major contaminant sources from the upper watershed, which include agricultural users, commercial users, industrial point source dischargers, storm-water lines, unlined and lined culverts, and residential and commercial point and nonpoint dischargers.</p>	<p align="center">Dr. Bin Zhang Jason Brodersen</p>
<p>Development of TMDL for Nawiliwili Bay, Kauai, Hawaii. For the Nawiliwili Bay TMDL study, TtEMI devised an innovative, cost-saving sampling scheme that relies on storm triggered automatic samplers to collect data on contaminants in storm-water runoff. This system allows the simultaneous sampling of runoff at seven critical and remote points along the watershed under unpredictable weather conditions. Using sampling data from the seven stream locations and two estuary locations, TtEMI is assisting with computer modeling to evaluate contaminant loading from the entire watershed to Nawiliwili Bay. The modeling results will be used to identify contaminant source reduction goals for major upland landowners that may be contributing to contamination in the streams and bay. In addition, TtEMI has prepared the Nawiliwili Bay watershed characterization report, which includes a stream assessment, description of hydraulic flow conditions, and invasive species evaluation. Side by side with the Hawaii DOH, TtEMI conducted a series of outreach meetings with stakeholders in the watershed, including commercial developers and landowners, agricultural users, City Planning Department staff, federal resource management agencies, and research and environmental groups.</p>	<p align="center">Dr. Bin Zhang Jason Brodersen</p>

TABLE 3 (Continued)
TtEMI PROJECT TEAM
RELEVANT PROJECT EXPERIENCE

Project Description	Project Team Member
<p>Kailua Bay Advisory Council (KBAC), Strategic Water Quality Improvement and Implementation Plan, Kailua Waterways System, Oahu, Hawaii. TtEMI assisted KBAC in developing a Strategic Water Quality Improvement and Implementation Plan to improve water quality in the Kailua waterways system on Oahu, Hawaii. TtEMI solicited members and formed an advisory-stakeholders group (ASG), made up of stakeholders and community members, to provide technical input to the plan. TtEMI also facilitated group meetings throughout the development of the plan to encourage stakeholder participation in describing and prioritizing water quality problems, identifying appropriate remedial measures, and outlining a strategy for implementing the most effective and feasible measures. At the final ASG meeting, TtEMI delivered a very well received and highly praised presentation to the ASG, the state, the city, U.S. Fish and Wildlife, State Fish and Game, U.S. Army Corp of Engineers, and the EPA outlining the implementation of the plan.</p>	<p>Dr. Bin Zhang Jason Brodersen</p>
<p>Fox River TMDL Analysis for the Illinois Environmental Protection Agency. TtEMI developed a sophisticated continuous hydrologic model using Hydrologic Simulation Program in Fortran (HSPF) to study watershed hydrology and water quality in the Fox River watershed, Richland County, IL. This study was completed in support of a TMDL study in the watershed for nutrients, siltation, and low dissolved oxygen. Few flow records are available for the Fox River; therefore, limited historical flow data were available to calibrate the HSPF model. As a result, TtEMI chose to develop a hydrologic model for the larger Little Wabash River Basin, containing the Fox River watershed. These results were then used to extrapolate flow in the Fox River. ARCVIEW GIS was used to delineate the watershed and derive hydrologic parameters. The total study area amounted to approximately 3,000 square miles and consisted of various land uses such as cropland, urban, forest, and wetland. The model was calibrated using three-years of daily flow data from 1990 to 1992 and was validated using flow data from 1993 to 1994. The model was verified using 1995 flow data at four USGS gage stations. The calibration was performed sequentially to each station from upstream to downstream of the Little Wabash River watershed. The calibrated HSPF model was used to generate the long-term daily flow time series, which is used to determine the pollutant load from various land uses and in stream water quality. The analysis supported the selection of management practices to reduce pollutant loads to the river. The merits of BMPs were compared for both urban and agriculture area, recommendations for BMP selection were made, and an implementation plan was created. TtEMI also got stakeholders involved in the watershed to collect data and get the feedback on water quality issue. Working with the state EPA, TtEMI successfully conducted the TMDL public hearing to present the results to the public.</p>	<p>Dr. Bin Zhang</p>
<p>Freezout Lake Wildlife Management Area (WMA) Water Management Plan, Fairfield, Montana. TtEMI developed a surface water monitoring plan that included over 20 surface water flow monitoring and sampling sites for the Montana department of Fish, Wildlife, and Parks. The purpose of this plan was to maximize the use of available water to provide and improve waterfowl production, staging, and resting habitat; and to minimize the impact of WMA discharges on the water quality of the Teton River. TtEMI summarized the existing water management practices, collected additional flow and water quality data, and developed a calibrated water balance model for the WMA. The water balance model was capable of evaluating a wide range of management decisions under wet, normal, and dry climatic conditions, and formed the basis for comparison of alternatives</p>	<p>Brian Antonioli</p>

TABLE 3 (Continued)
TtEMI PROJECT TEAM
RELEVANT PROJECT EXPERIENCE

Project Description	Project Team Member
<p>Source Water Protection, Montana Department of Transportation, Montana. TtEMI implemented and completed 40 source water delineation, inventory, and susceptibility assessment reports at rest areas and springs throughout Montana. The source water delineation and assessment reports were designed to satisfy the requirements of the Montana Department of Environmental Quality (DEQ) Source Water Protection Program (SWPP). The 1996 amendments to the 1986 Safe Drinking Water Act requires states to develop and implement a SWPP to assess existing and potential threats to public water supplies. GIS maps were created to accompany each SWPP report. The maps illustrated source water wellhead location, rest area location and proximity of these locations to river reaches. Locations were displayed on scale appropriate USGS quads and the 1999 USGS National Landcover 90 meter resolution data set. Data was compiled for the existing 1 mile wide by 10 mile long river corridor in the inventory region. Point source pollution and septic density were then analyzed in reference to these inventory regions.</p>	<p>Dave Donohue Alice Stanley Ed Madej Randy Laskowski</p>
<p>Point Mugu Integrated Natural Resources Management Plan, Department of the Navy. TtEMI assisted the Navy with the preparation of their Integrated Natural Resources Management Plan (INRMP). Work included collection and interpretation of data on natural resources including threatened and endangered species, species of special concern, habitat type classifications, wetlands and special aquatic sites, restoration activities, and the preparation of management goals, objectives, and guidelines to manage the natural resources. The INRMP describes the habitat types at Point Mugu (vegetation type, wildlife communities, special status listed species, and special aquatic sites) and provides goals and guidelines for conserving, restoring, and managing areas as appropriate. TtEMI also prepared an Environmental Assessment under NEPA for a proposed implementation of the INRMP. Responsibilities included coordination, assisting lead agencies in alternatives development, development of mitigation measures, and public participation events.</p>	<p>Kathryn Norris Chris Martin Ed Madej Jenn Guigliano Ray Bienert</p>
<p>Tenmile Creek NPL Site, Montana. TtEMI under contract to CDM Federal Programs provided field personnel to assist in the characterization of surface waters including seeps, mine adit discharges, streams and ponds within the Tenmile Creek drainage basin which serves as the Helena, Montana public water supply source. Surface water assessments included collecting stream flows, collecting water samples for laboratory analysis for metals and water quality parameters, collecting field water quality parameters and collecting sediment samples. Samples and field measurements were collected on a regular schedule at USGS gauging stations as well as a variety of temporary stations based on mine locations and drainage confluences. Sampling was also performed on instant notice during storm events. Data from the surface water sampling and mine characterizations was used to determine background metals levels, storm event metals and sediment loading rates, and point source loading locations from abandon mines.</p>	<p>Brian Antonioli Ed Madej Ed Surbrugg Joe Faubion</p>
<p>Bunker Hill Mine Reclamation, USFS Region 1, Helena, Montana. TtEMI completed the evaluation of a potential removal action at the Bunker Hill Mine, Tenmile Creek, Lewis and Clark County, Montana. Conditions at the mine site resulted in significant erosional impacts to the previously reclaimed hillside and deposition of sediments with high metal concentrations along the streambank of Tenmile Creek, the main water supply for the City of Helena, and in the riparian zone. TtEMI managed the project, collected soil samples from the waste material and sediment samples from the stream channel, designed two sedimentation ponds and the streambank stabilization techniques, and prepared the construction bid package to address the erosion and streambank stabilization problems associated with the mine and Tenmile Creek. TtEMI also participated in community meetings.</p>	<p>Brian Antonioli Ed Surbrugg</p>

TABLE 3 (Continued)
TtEMI PROJECT TEAM
RELEVANT PROJECT EXPERIENCE

Project Description	Project Team Member
<p>Georgetown Railroad Abandoned Mine Site, Montana Department of Environmental Quality – Western Montana. TtEMI investigated a 5 mile-long abandoned railroad grade in western Montana. Contaminant source material included mine waste rock and smelter slag used as the railroad bed material. TtEMI collected surface water, sediment, and soil samples to evaluate impacts on the associated wetlands, surface water, groundwater, soil, and sediment. Samples were collected and analyzed for metals and water quality parameters.</p>	<p>Brian Antonioli</p>
<p>Upper Blackfoot Mining Complex, Western Montana. TtEMI investigated the Upper Blackfoot Mining Complex and associated wetlands and streams to evaluate the potential impact on the Blackfoot River. Contamination from several abandoned mine sites in the drainage, including acid mine drainage and stream sediment impacts, were evaluated. The site was investigated to evaluate impacts on the associated wetlands, surface water, groundwater, soil, and sediment. Samples were collected from surface water, sediment, and soils and analyzed for metals and water quality parameters.</p>	<p>Brian Antonioli Dave Donohue</p>
<p>Silver Bow Creek, Mine Waste Cleanup, NPL Site, Helena, Montana. TtEMI evaluated the impact of tailings on the shallow groundwater system at the Silver Bow Creek Superfund site for EPA Region 8. Contaminants leached from the vadose zone and the flow of shallow groundwater through the tailings potentially affects groundwater along the creek. TtEMI estimated the leaching rate from the tailings into the shallow groundwater, assessed the geochemical characteristics of sediments along the creek, and researched the attenuation mechanisms retarding contaminant migration from the tailings into the groundwater.</p>	<p>Ed Surbrugg Brian Antonioli Joe Faubion</p>
<p>Tenmile Creek Feasibility Study, NPL Site, Montana. TtEMI worked with the U.S. EPA to develop the feasibility study for the Tenmile Superfund site. The NPL site includes the water supply watershed for the City of Helena and over one hundred abandoned mine sites that have resulted in heavy metal contamination of surface and ground water within the watershed. TtEMI evaluated a wide variety of remediation technologies including acid mine drainage (AMD) minimization and biological and physical-chemical treatment of AMD and AMD impacted surface waters.</p>	<p>Brian Antonioli</p>
<p>Alta Mine Site, Western Montana. TtEMI evaluated the potential changes in water quality in a tributary to Corbin Creek due to the removal of a large waste rock dump. The evaluation consisted of geochemical modeling of surface water and groundwater characteristics in the drainage. TtEMI completed the modeling using MINTEQA2 to evaluate the mobility of heavy metals and estimate the relative proportions of metals due to shaft discharge and to leaching from the waste rock dump.</p>	<p>Brian Antonioli Ed Surbrugg</p>
<p>Stormwater Management, Naval Base Ventura County (NBVC), California. TtEMI has managed the storm water compliance at NBVC for seven years. As part of the NPDES monitoring program, intensive work was performed under GIS Services. Storm water data has been collected and stored in an Oracle database system where data is exported directly to ArcInfo and ArcView for displaying and analysis. To minimize point source pollution, storm water systems were re-mapped using a Global Positioning System (GPS) survey. GIS analysis included creating digital elevation model surfaces, watershed modeling, sheet flow direction and drainage area delineations.</p>	<p>Kathryn Norris Ed Madej Chris Martin Jennifer Guigliano Alice Stanley Aaron Cade</p>
<p>Upper Yellowstone Watershed Ecological Characterization, Southcentral Montana and Northwestern Wyoming. TtEMI assembled existing geographic base data for the Yellowstone Watershed and integrated the data with the Montana Natural Heritage Program's rare plant and animal databases. TtEMI produced a CDROM with an ArcExplorer GIS project with interactive maps for examination of the geographic data by project participants.</p>	<p>Ed Madej</p>

TABLE 3 (Continued)
TtEMI PROJECT TEAM
RELEVANT PROJECT EXPERIENCE

Project Description	Project Team Member
<p>Tom Miner Creek Stream Characterization. Stream/riparian geomorphic characterization and hydrologic classification of 4,500 feet of impaired upper reaches of Tom Miner Creek, Park County, Montana. The project coordinated with fisheries inventories, macroinvertebrate sampling, and determination of mass wasting concerns as a result of historic timber harvesting operations (as interpreted from historic and recent aerial photogrammetry of the entire sub-alpine watershed). Suspended sediment load sampling and projections were calibrated to future regulated and unregulated flood flows. Monumented cross-sections were established and flow meters installed and operated since 1999. Detailed Wolman pebble counts were performed to determine D50 and D84 particle size distributions to assess headcutting and lateral migration problems, and to compare various hydrologic conditions and geomorphic processes based on the type of classification system used (i.e., Rosgen versus Montgomery/Buffington, Stream Visual Assessment Protocol (SVAP), and Thorne (U.S. ACOE). This detailed project study culminated with biostabilization techniques to control bank sloughing and grazing management changes to protect riparian floodplain habitat. Irrigation distribution plans were also changed to protect adjacent riverine wetlands and supplement long-term ranch management plans. As a result of the detailed hydrologic monitoring performed prior to, during, and after changes in land management and restoration techniques, this reach of Tom Miner Creek has experienced minimal headcutting problems while allowing the overbank discharges to reestablish natural levee formation and healthy bank vegetation.</p>	<p>Joe Michaletz (Subcontractor)</p>
<p>Public Relations Support for the Environmental Impact Statement for the Proposed Withdrawal of the Limestone Hills Training Area. For the Montana Army National Guard, TtEMI developed and is currently implementing a public relations strategy for the proposed withdrawal of the Limestone Hills Training Area (LHTA), near Townsend, Montana. This has included developing a comprehensive public relations plan; organizing and assisting in a series of public meetings; preparing and distributing press releases and advertisements for radio and print media; designing, producing and distributing informational brochures; preparing presentation materials and posters; organizing and assisting in an Open House of the LHTA; and facilitating stakeholder working group meetings. TtEMI also developed a project website. Many of the materials that TtEMI developed can be reviewed at this project website at www.limestonehillswithdrawal.com.</p>	<p>Linda Daehn Alane Dallas Ed Madej Alice Stanley</p>
<p>Public Participation Support for the Environmental Impact Statement and Resource Management Plan for the Bureau of Land Management, Butte Field Office. TtEMI is assisting the Bureau of Land Management, Butte Field Office in developing and implementing a public participation strategy for the environmental impact statement and revision of its existing Resource Management Plan (RMP). This has included developing a public participation plan; organizing and assisting in six public scoping meetings; preparing and distributing press releases; producing an informational brochure; preparing presentation materials and posters; and assisting in developing a project website. TtEMI also prepared a scoping summary report.</p>	<p>Linda Daehn Alane Dallas Ed Madej Alice Stanley</p>
<p>Analytical Database Development and Management. TtEMI developed and is currently managing a database compatible to all of the client's prerequisites. In addition to managing data generated by TtEMI's field work historical data was cleaned up and imported into the newly developed database. Electronic analytical data continue to be imported into the database. In support of the ongoing CECRA activities at the site, Excell, Access, and Crystal Reports are being used for data analysis and reporting. The data warehousing is in a SQL Server, GIS figures are linked to this data, custom queries have been created for report use, and periodic "data snapshots" of the entire database in Access file format are generated for the client and end users.</p>	<p>Aaron Cade</p>

TABLE 3 (Continued)
TtEMI PROJECT TEAM
RELEVANT PROJECT EXPERIENCE

Project Description	Project Team Member
<p>ArcView for ArcGIS Training. Preparation and teaching of two 2 ½ day courses utilizing air quality data in ArcView for ArcGIS 8.3. The first course, the ESRI authorized Introduction to ArcView for ArcGIS was taught in May of 2003 to 15 students from the Air Resources Management Bureau. The second course, a custom designed course produced by TtEMI Advanced Techniques for ArcView for ArcGIS was taught to ten students in early September 2003.</p>	Ed Madej
<p>Remote Sensing, Revegetation Services, Land Use Planning Services. TtEMI has been providing the Montana Bureau of Land Management with abandoned mine reclamation design services in Montana, North Dakota, and South Dakota. To date, work has been performed under six delivery orders and consisted of site characterization, chemical sampling and analysis, human and ecological risk assessments, cultural resource investigations, mine claim and property ownership determinations, preparation of investigation reports and engineering evaluations/cost analysis documents, preparation of reclamation and revegetation plans, engineering project designs and plans and specifications, and reclamation project construction oversight. As part of the sampling and investigations, aerial photography, remote sensing, surveying, and site mapping services were completed. Abandoned mine reclamation activities have been completed at the Lower Indian Creek, Rochester Creek, and Nez Perce Creek Drainage in Montana. In addition, TtEMI compiled and prepared over 50 engineering technical specifications to specifically address abandoned mine reclamation construction activities at hard-rock and placer mine sites in the Rocky Mountain region.</p>	Ed Surbrugg Ed Madej
<p>Development of a Resource Management Plan for the U.S. Bureau of Land Management Butte Field Office Planning Area. TtEMI has teamed with three Tetra Tech sister companies to develop a Resource Management Plan (RMP) and Environmental Impact Statement for the Bureau of Land Management (BLM) Butte Field Office. Responsibilities of the TtEMI Helena office include coordination with agency resource specialists and cooperating agencies, data collection, development of an analysis of the current management situation, inventory of existing resource conditions, preparation of an RMP; management of a 25-member EIS interdisciplinary team; issue identification; public relations activities; baseline data collection; alternatives and mitigation measures development; EIS preparation; and assisting the agency with public response activities.</p> <p>TtEMI has assisted the BLM in developing and implementing a public participation strategy for the land use planning process. This has included developing a public participation plan; organizing and assisting in six public scoping meetings; preparing and distributing press releases; producing an informational brochure; preparing presentation materials and posters; and assisting in developing a project website. TtEMI also prepared a scoping summary report.</p>	Alice Stanley Linda Daehn Ed Surbrugg Ed Madej Alane Dallas
<p>Regulatory Guidance Manuals. Ms. Alice Stanley authored two stormwater management guidance manuals under contract with the Montana DEQ. The guidance documents contain descriptions of stormwater management practices recommended for controlling the quantity and enhancing the quality of stormwater runoff at industrial, construction and mining sites. The manuals were designed to be used by industrial facilities and by DEQ staff for their evaluation of Stormwater Pollution Prevention Plans and Erosion Control Plans submitted by the regulated community. Ms. Stanley also developed a waste management brochure addressing the proper use of dry wells for the DEQ groundwater protection program. Ms. Stanley was also contracted with the Montana DEQ to provide guidance to the regulated community in the form of stormwater management workshops at various locations in Montana.</p>	Alice Stanley

FIGURE 2: SUMMARY OF PERSONNEL QUALIFICATIONS AND CREDENTIALS

NAME	PROJECT ASSIGNMENT	YEARS OF PROFESSIONAL EXPERIENCE/ YEARS OF SIMILAR PROJECT EXPERIENCE	DEGREE(S)	WATER QUALITY MONITORING – FIXED STATION AND PROBABILISTIC DESIGN	WATER QUALITY MONITORING – LAKES AND STREAMS	WATER QUALITY MONITORING – REFERENCE SITES	TMDL TARGETS	TMDL SOURC ASSESSMENT/DELINEATION	TMDL LAD ALLOCATIONS	TOTAL MAXIMUM DAILY LOADS	STAKEHOLDER PARTICIPATION	TMDL EFFECTIVENESS MONITORING	GIS SERVICES	REMOTE SENSING	WATER QUALITY MODELING	STATISTICAL ANALYSIS	DEQ ELECTRONIC DATA/INFORMATION TECHNICAL ASSISTANCE	REVEGETATION SERVICES	INFORMATION TRANSFER AND TMDL TECHNICAL EDITING	LAND USE PLANNING SERVICES	TECHNICAL MANUALS OR CIRCULARS
Laura Newman, P.E.	Project Coordinator	11/7	M.S. Administration/ B.S. Geological Engineering								•								•		•
Bin Zhang, PhD, P.E.	TMDL Technical Advisor	18/10	Ph.D. Environmental Engineering / M.E. Geotechnical Engineering B.E. Civil Engineering	•	•	•	•	•	•	•	•		•		•	•					•
Kathryn Norris	Lead Technical Coordinator Surface Water Assessments PM	24/11	B.A. Geology	•	•	•		•	•		•	•									•
Ed Madej	Lead Technical Coordinator Support Services	29/19	B.S. Biology and Oceanography										•				•		•		
Linda Daehn	Lead Technical Coordinator Public Relations and Education	16/16	B.S. Journalism								•								•		•
Chris Martin	Surface Water Monitoring and Assessment	24/17	B.A. Mathematics B.S. Watershed Science	•	•	•				•						•					•
Jason Brodersen, P.G.	TMDL Assessment And Modeling	15/13	B.S. Geophysics	•	•	•	•	•	•	•	•		•		•						•
Joe Michaletz, P.G. (Subcontractor)	Stream Classification and Flow and Transport Modeling	17/10	Certificate of Honors, 1990 B.S. Geology and Geophysics	•	•	•		•	•				•								
Alice Stanley, P.G.	Land Use Planning Services Stream Characteristics	19/17	B.A. Geology M.S. Hydrogeology	•	•	•					•									•	
Jennifer Guigliano, EIT	Watershed Assessment Land Use Planning	9/9	M.E. Environmental Engineering B.S., Combined Science					•	•									•		•	
Aaron Cade	Database Management Information Technology Services	10/10	B.A. Biology													•	•		•		•

General Staff Qualifications

To assist in the implementation of requested water quality monitoring and assessment services in Montana, TtEMI offers the State of Montana a project team that has proven performance in the design and implementation of water quality monitoring and assessment, determination of TMDL targets, source assessment and delineation, load allocations and effectiveness monitoring, watershed restoration, land use planning, and public communication and educational support services. Benefits our key personnel bring to this project are:

Local Experience. TtEMI provides a team headquartered in Helena, Montana. Team technical leaders are thoroughly familiar with Montana watershed locations, characteristics, local information sources, and applicable water quality requirements.

Organizational Structure. Our team organization of one contract coordinator assisted by four service area lead technical coordinators is designed to easily handle multiple projects simultaneously under the direction of senior managers with relevant expertise.

Vast Resources. The State of Montana and other stakeholders involved in future watershed studies will benefit from having direct access to the resources of a major, nationwide water resources engineering firm with full-service local expertise.

Discipline Coverage and Specialized Expertise. We have assembled a group of technical staff with a broad range of expertise. The team is composed of individual specialists, yet most of the proposed personnel have worked together as a team for years.

Proposed Project Team

The organizational structure of our proposed project team is presented in **Figure 1**. Our proposed team is structured to use the most technically appropriate and cost effective personnel from the Montana office as well as specialized corporate services when needed for each given task. Most of the proposed team members have extensive previous experience with the State of Montana including the Department of Environmental Quality, Fish, Wildlife and Parks, and the Department of Transportation projects. Our projects coordinator, Ms. Laura Newman, will be responsible for coordinating directly with State of Montana project managers. Ms. Newman has managed several large-scale projects and is familiar with contracting requirements and the high standards the State of Montana expects from their environmental contractors. Ms Newman will be assisted by Dr. Bin Zhang (TMDL technical advisor); and by Ms. Kathryn Norris, Ms. Linda Daehn, Mr. Ed Madej, and Ms. Alice Stanley, who have extensive expertise in the general service areas of surface water assessment, public affairs support services, and land use planning. This organizational structure allows TtEMI to respond quickly to multiple requests for services and insure that tasks are managed by a team leader with relevant expertise. This section highlights the specific qualifications of our proposed key personnel, emphasizing their relevant experience on similar watershed and resource management projects.

Ms. Laura Newman, PE - Projects Coordinator (Helena)

Ms. Newman will serve as overall projects coordinator and will be the initial point of contact for the State of Montana. Ms. Newman will be responsible for contracting issues, insuring quality control, and delegating task responsibility to one of four lead technical coordinators (**Figure 1**). Ms. Newman is a professional civil engineer experienced in environmental, geological, and hydrogeological investigations. She has extensive project management experience and is proficient at overseeing the technical work of multiple projects; developing long-term strategies; budgeting and projecting funding requirements; resolving technical and administrative issues; and providing client and regulatory agency relations. Ms. Newman's additional experience includes surface and groundwater investigations, soil investigations, data assessment, and report preparation. Ms. Newman is also experienced in preparing project presentations, fact sheets, poster boards, and facilitating community outreach meetings.

Bin Zhang, PhD – TMDL Technical Advisor and QA/QC (Honolulu)

We are fortunate to have Dr. Bin Zhang join our project team. He has been a lead modeler and hydrologist supporting state and local governments in a variety of watershed assessment, water quality, point and non-point pollution control, TMDL, watershed modeling, flood studies, and ecosystem restoration and protection

studies. Dr. Zhang will assist Ms. Newman and TtEMI service area lead technical coordinators as senior technical advisor and quality assurance and control. Dr. Zhang, a civil/water resources engineer and modeler, has 10 years of experience in watershed planning, the development, application, and evaluation of hydrologic and hydraulic/hydrodynamic models, and engineering design. Dr. Zhang is proficient with many water resource management, analysis, and modeling tools. He has developed nutrient, dissolved oxygen, pH, sediment, and pathogen water quality models for over a thousand square miles of watershed in the United States. Dr. Zhang has used the GIS-based USEPA BASINS platform to develop “a watershed” model to assess nonpoint source load in agricultural land of watershed and point sources in urban areas. Dr. Zhang is also proficient with HEC-HMS hydrologic model, and HEC-RAS steady and unsteady flow hydraulic model, the Storm Water Management Model (SWMM) in GIS environment. In addition, Dr. Zhang is familiar with many water and water quality models such as QUAL2E, WASP, EFDC, CE-QUAL-W2, SWAT, BATHTUB, TR-20, TR-55, HY8, WSP2, and is proficient in using ARC VIEW GIS and its new generation ArcGIS 8.3 for environment assessment, watershed and water quality modeling, geographic mapping, spatial analysis, and site selections.

Ms. Kathryn Norris – Lead Technical Coordinator, Surface Water Assessment (Helena)

Ms. Kathryn Norris will assist Ms. Newman as lead technical coordinator for the water quality monitoring, TMDL targets, TMDL source assessment, TMDL load allocations, TMDLs, and TMDL effectiveness monitoring service areas. Ms. Norris has extensive experience as project manager for natural resource planning, watershed management, and storm water management at large and small facilities. Ms. Norris' water quality management experience includes evaluation of surface water and groundwater quality and flow in watersheds to identify and assess potential contaminant source areas and impacts in 303 (d) listed creeks. Ms. Norris has performed and managed field investigations including risk assessments, sediment, soil, groundwater and surface water sampling, hydrologic models for both groundwater and surface water, bathymetric surveys, and watershed monitoring. Ms. Norris has also managed natural resources projects including Integrated Natural Resource Management Plans, and watershed models. In addition, Ms. Norris has overseen design and development of GIS/database systems for large scale environmental investigations and storm water and surface water quality compliance programs.

Ms. Linda Daehn – Lead Technical Coordinator, Public Affairs (Helena)

Ms. Linda Daehn will serve as technical lead for public relations activities including stakeholder participation, watershed coordination, communication/educational services, and preparation of technical manuals or circulars. Ms. Daehn is exceptionally well qualified in the field of public relations with 16 years of experience in public affairs, technology transfer, and environmental communications. She is experienced in stakeholder participation, coordination of stakeholder groups, information transfer, and preparation of technical manuals. In particular, Ms. Daehn has organized and facilitated public meetings; designed and produced information for target audiences; generated and disseminated press releases; assisted in video production; produced pamphlets and brochures; made presentations at workshops and conferences; organized conferences and stakeholder groups; and designed information for websites. Ms. Daehn currently manages the public relations and education activities for development of a new resource management plan for the U.S. Bureau of Land Management Butte Field Office area and is responsible for direction public relations activities for a National Guard unexploded ordnance clearance program.

Mr. Ed Madej – Lead Technical Coordinator, Support Services (Helena)

Mr. Ed Madej will serve as Support Services Technical Lead for tasks such as GIS, remote sensing, water quality modeling, statistical analysis, and information technology assistance. Mr. Madej has 19 years of experience in GIS and digital cartography, including 8 years as an authorized instructor of the popular ESRI ArcView GIS software. Mr. Madej has used GIS technology to analyze geographic data in a wide variety of projects, and has published dozens of digitally produced maps, including the official 2001-2002 Montana State Highway Map. His skills include GIS project management, GIS modeling and analysis, remote sensing/image analysis, and interactive GIS web mapping. Since 1995, through workshops and three-day classes, Mr. Madej has instructed more than 600 professionals throughout the western U.S. on how to use GIS technology in their work with natural resource management, water resources, mine remediation and biological conservation. Mr. Madej is the author of the recently published technical book, *Cartographic Design Using ArcView GIS*, available through OnWord Press, and co-author of the *Conservation GIS Starter Kit*.

Ms. Alice Stanley, P.G.-Lead Technical Coordinator, Land Use Planning (Helena)

Ms. Stanley will serve as the lead technical coordinator for revegetation and land use planning services. Ms. Stanley has more than 17 years experience providing technical expertise and regulatory guidance in the areas of land use planning, surface water hydrology, watershed pollution prevention and Montana and National Environmental Policy Action (MEPA and NEPA) compliance. Projects managed by Ms. Stanley have included resource management plan development and impacts assessment, source water assessments, watershed delineation and threats inventories, surface water quality and quantity assessments, and development of mine waste drainage mitigation measures. Ms. Stanley has coordinated the preparation of numerous MEPA and NEPA documents on behalf of various federal and state agencies including the U.S. Forest Service, U.S. Bureau of Land Management, the U.S. Departments of the Army and Air Force, the National Institutes of Health, the Montana Departments of Environmental Quality, of Transportation, of Military Affairs and of Fish, Wildlife and Parks for proposed projects such as resource management plans, mine expansions, industrial facilities, linear facilities, timber harvests and livestock operations. Ms. Stanley is currently assisting the Bureau of Land Management in developing a resource management plan for an eight-county region in central Montana.

Proposed Subcontractors

To support and compliment our proposed project team, TtEMI may draw upon the expertise and subcontracting services of Mr. Joe Michaletz.

Mr. Joe Michaletz – Stream Classification and Flow and Transport Modeling (Helena)

Mr. Michaletz is a geologist/hydrologist with over 10 years of experience in geologic, hydrogeologic, geophysical, and water resource investigations. Mr. Michaletz is proficient in flow and sediment transport modeling, assessment for surface water classification, bank stabilization, and monitoring for sedimentation reduction. Mr. Michaletz recently completed a stream/riparian geomorphic characterization and hydrologic classification of 4,500 feet of impaired upper reaches of Tom Miner Creek, Park County, Montana. The project coordinated with fisheries inventories, macroinvertebrate sampling, and determination of mass wasting concerns as a result of historic timber harvesting operations (as interpreted from historic and recent aerial photogrammetry of the entire sub-alpine watershed).

4.1.3 Method of Providing Services & Quality Assurance

TtEMI understands and will comply.

TtEMI is recognized for its outstanding customer service and exact attention to detail and quality assurance. The project example discussed below highlights TtEMI's abilities to meet and exceed customer's expectations.

Calleguas Creek Watershed Monitoring, Point Mugu California

TtEMI was awarded a contract to design and implement a watershed conceptual site model for the Mugu Lagoon, at Naval Base Ventura County, Point Mugu, California. The Mugu Lagoon is the receiving water for the 303 (d) listed Calleguas Creek, which is the primary stream in the 380 square mile watershed. The purpose of the watershed investigation was to obtain additional chemical and physical data on surface water and suspended sediments flowing into Mugu Lagoon from off-site sources entering the system in Calleguas Creek and a nearby tributary, Revolon Slough. The data was then used to develop a sediment loading curve and turbidity curve for the creek that would show how concentrations of chemicals identified in Calleguas Creek are being transported.

TtEMI developed a sampling analysis plan (SAP) that operates as the guideline for adherence to project goals and standards. The SAP is also used by the field personnel to assure that sample collection and monitoring is performed in accordance with the project objectives. In addition, the project was dependent upon installation, operation, and maintenance of the highly sensitive and valuable multi-parameter sonde and current meter. The SAP contains each vendor's standard operating procedures so that the field personnel can obtain information quickly while maintaining or trouble-shooting equipment as needs arise. An essential tool used in the SAP was the development of data quality objectives (DQOs) and data quality assessments (DQA), using the current guidelines promulgated by EPA. TtEMI defined the DQOs for the project using the 7 step process defined in the DQO/DQA EPA guidance. In summary, the DQO steps included the following:

State the Problem

- Evaluate the levels of contaminants in Calleguas Creek and Revolon Slough in surface water accounting for seasonal variations with an emphasis on storm events
- Identify concentrations of total suspended solids (TSS) in surface water in Calleguas Creek that may affect transport of solids.

Identify the Decisions

- Establish a sediment loading curve and a baseline for TSS, metals and pesticides for the lower Calleguas Creek watershed

Identify Inputs to the Decisions

- Collect validated defensible data
- Measure physical characteristics of the surface water
- Compile existing chemical and water quality data from other investigations
- Collect additional water quality and sampling data

Define the boundary

- Select a fixed station monitoring location in Calleguas Creek
- Select two additional upstream sampling locations for collection of chemical data for laboratory analysis
- Design sampling scheme, frequency, and schedule
- Assign the correct laboratory analyses and method detection limits

Develop Decision Rules

- Detectable concentrations of water quality parameters and chemicals will be used to develop a sediment rating curve
- If detectable concentrations of water quality parameters and chemicals are not detected, then select alternative methods

Specify Tolerable Limits on Decision Errors

- Errors in sampling and analytical methods are assessed using quality assurance/quality control (QA/QC) goals
- Regulatory screening criteria are specified to assure that laboratory method levels can meet these goals
- Statistical analyses will be designed to assure a 95 percent confidence level in the results

Optimize Sampling Design

- Identify the number of samples to achieve the goals
- Identify the number and nature of sampling events to achieve the goals

The above DQOs were implemented throughout the course of the project to assure that the water quality monitoring objectives and goals are met. Data quality assessments have been performed monthly to assure that the design is meeting the goals. This has been achieved on this project by evaluating the data collected, creation of a database that manipulates the data, and evaluating trends that indicate if the DQOs need to be adjusted to meet the objectives and goals of the program. For example, the automatic water quality monitoring equipment installed in the creek collects continuous water quality parameter data that is entered into the database and is then evaluated. Based on monthly evaluations, it was identified that during non-storm events, TSS concentrations vary slightly, which was not producing a wide range of points on the sediment-loading curve. Therefore, the sampling design was adjusted to collect more data during varying storm events.

In order to assure that water quality data is being collected by the data logger continuously and that the equipment is functioning properly in a harsh, submerged, saline environment, equipment maintenance and calibrations are performed monthly to assure quality data. Cross sectional surveys are also performed at the same time to address variations in stream channel depths and depositional variations. In conjunction with the collection of the water quality data, a geographic information system is being used for the project to perform land use analysis of upstream source areas over time, development and display of chemical concentrations and sample locations collected for the identification of TMDLs in the 303 (d) listed stream, and USGS water

quality monitoring data being collected by the USGS upstream of TtEMI's fixed station. TtEMI designed the water quality program in lower Calleguas Creek to mirror the USGS effort so that the data is compatible.

The SAP outlines the schedule for the project. TtEMI developed the work plans in adherence with the schedule. The fieldwork was performed as stated in the SAP, until DQAs performed identified that the field sampling schedule needed to be revised. The schedule was revised and is reported in the monthly status report so that the client is up to date with the schedule as well as using the updated schedule to track progress. A copy of the SAP discussed above is included as Appendix G.

In addition to using the stringent DQO/DQA process, TtEMI has a three-stage QA/QC process that includes an editorial review, technical review, and final QC review to ensure quality of the work product. The editorial reviewer verifies document clarity, readability, organization, and overall presentation. The technical reviewer focuses on technical validity, regulatory consistency, legal implications, and standards of industry practice. One additional purpose of the technical review is to ensure consistency throughout the project. The primary purpose of the final QC review is to ensure that a high-quality, consistent work product is delivered to the client. The final QA/QC specialist will assist the project manager in ensuring that final deliverables are technically sound, grammatically correct, and fulfill project and contract requirements.

TtEMI will utilize the methods, approach, and QA/QC process described above to implement projects for Montana State Agencies under this contract. The project coordinator, Ms. Laura Newman, will coordinate directly with the state to identify and set up appropriate projects. Once a project has been identified, Ms. Newman will delegate the project to one of four lead technical coordinators depending on the applicable service area under which the project is characterized.

The lead technical coordinators will then identify the appropriate specialists, engineers, and support staff and will implement and manage the project following the same procedures described above.

4.1.4 Staff Qualifications

TtEMI understands and will comply.

The TtEMI project team is exceptionally well-qualified to provide water quality monitoring, assessment and restoration services throughout Montana. In addition we have extensive expertise in public participation and education, and services that support these activities such as GIS, remote sensing, engineering, and information technology.

All personnel selected to work on the contract are listed in Figure 2 which provides information regarding project team education, years of professional experience, and years of experience on projects similar to those that may be completed under this contract. Areas of expertise specific to service areas for each team member are also shown in Figure 2. Two-page resumes are provided in Appendix F. Detailed information describing the project manager, key technical staff, and subcontractors are provided in Section 4.1.2.

We anticipate that the State of Montana would prefer to contract with a firm that shows project experience specific to the proposed team members. While TtEMI is nationally known for its water quality assessment services, we have chosen to highlight only those projects managed or conducted by proposed team members. We are proud to present a project team that is not only highly qualified for all proposed service areas, but also composed primarily of Montana scientists and engineers. A summary description of relevant projects completed or ongoing by project team members is provided in Table 3.

4.2 OFFEROR QUALIFICATION REQUIREMENTS – SPECIFIC SERVICE CATEGORIES

TtEMI understands and will comply.

Our proposed project team is shown graphically in Figure 1 with qualifications described in Section 4.1 and in Appendix F. Ninety percent of our proposed team members hold a bachelor degree in a natural science or engineering field, and 35 percent hold advanced degrees. Our approach to complex projects such as

watershed assessment, monitoring, and restoration is to use an interdisciplinary team composed of scientists and engineers with experience working together. While all members of our proposed project team have contributed to many projects outside Montana, 75% of the proposed team are longtime Montana residents and have teamed on several projects.

Our team qualifications are described in full in section 4.1 of this proposal summarized in this section for each service area. Ms. Laura Newman will serve as the Project Manager for all service categories that TtEMI has proposed for. A lead technical coordinator has been selected for each service category. In addition, team members expertise is shown by service area in Figure 2. Table 3 summarizes relevant project experience for each service area and select team members.

4.2.1 Water Quality Monitoring – Fixed Station and Probabilistic Design

TtEMI understands and will comply.

Lead Technical Coordinator: Kathryn Norris

TtEMI provides monitoring design services for fixed and transient station surface water monitoring programs. Specific project team monitoring design experience is described below. Field parameter measurement, sample collection, stream characterization experience is described under Section 4.2.2. Project team remote sensing expertise is described under 4.2.11.

Our company profile, a full description of proposed project team qualifications, and a description of our method of providing services and quality assurance is provided in Section 4.1. References are listed in Table 2. Figure 2 provides a summary of relevant expertise and credentials for project team members. Table 3 provides examples of relevant project experience for proposed team members for services specific to monitoring design.

The proposed TtEMI team has extensive experience in the design and data management of surface water sampling programs including watershed evaluations that require an understanding of organic and inorganic chemicals, biological components (such as macroinvertebrates, algae and chlorophyll), sediment load, and trace metals. Members of our project team have designed numerous water quality monitoring projects throughout the state of Montana as well as nationwide. **Ms. Kathryn Norris** and **Mr. Chris Martin** specialize in the design of fixed station monitoring networks and statistical analysis for surface water evaluations. **Dr. Bin Zhang** and **Mr. Jason Brodersen** have designed fixed station TMDL monitoring plans for large watersheds in Hawaii, Illinois and Indiana. **Mr. Brian Antonioli** has many years of experience designing water quality evaluation programs for watersheds affected by mining activities. **Joe Michaletz** has experience with monitoring design of watersheds for the impacts of timber harvests and other wood products industry activities. **Mr. Aaron Cade**, **Mr. Ed Madej**, and **Ms. Susan Parks** also will assist the project team with sample station location design through the use of GIS, remote sensing, and database management.

4.2.2 Water Quality Monitoring – Lakes and Streams

TtEMI understands and will comply.

Lead Technical Coordinator: Kathryn Norris

TtEMI will provide water quality monitoring services including fixed and transient station monitoring, field parameter evaluation, sample collection and handling, surface water characterization, and data management. Our project team has considerable experience in the collection and field analysis of samples for sediment and water chemistry in Montana, and in stream assessment for geomorphology, habitat and sources of pollution. Specific project team monitoring experience is described below.

Our company profile, a full description of proposed project team qualifications, and a description of our method of providing services and quality assurance is provided in Section 4.1. References are listed in Table 2. Figure 2 provides a summary of relevant expertise and credentials for project team members. Table 3 provides examples of relevant project experience for proposed team members for services specific to water quality monitoring of lakes and streams.

Ms. Norris will be supported by several team members who have extensive experience in stream reach and watershed evaluation services that characterize geomorphology, habitat and stream health using various field and remote sensing methods such as Rosgen and GIS imagery analysis. **Joe Michaletz** has recently completed several water resource and geomorphic inventories for conservation easements including a stream/riparian geomorphic characterization and hydrologic classification of impaired upper reaches of Tom Miner Creek in Park County, Montana. **Dr. Ed Surbrugg** has more than 20 years of experience identifying and delineating wetlands and is thoroughly familiar with wetland habitats throughout Montana. The team will also be assisted by **Dave Donohue** and **Alice Stanley** who have completed dozens of source water assessments in the state of Montana to identify probable basin-wide pollutant sources to drinking water supplies. Example projects presented in Table 3 highlight our team expertise relative to water quality monitoring of lakes and streams. **Joe Faubion** and **Randy Laskowski** will provide field sampling services. Both have conducted field monitoring of surface throughout Montana for over 15 years. **Mr. Faubion** also served as the TMDL field sampling coordinator for the TMDL study of Powder and Tongue Rivers.

4.2.3 Water Quality Monitoring – Reference Sites

TtEMI understands and will comply.

Lead Technical Coordinator: Kathryn Norris

TtEMI provides monitoring design and implementation services for fixed and transient station surface water monitoring programs. Specific project team monitoring design experience is described in Section 4.2.1. Field parameter measurement, sample collection, stream characterization experience is described under Section 4.2.2.

Our company profile, a full description of proposed project team qualifications, and a description of our method of providing services and quality assurance is provided in Section 4.1. References are listed in Table 2. Figure 2 provides a summary of relevant expertise and credentials for project team members. Table 3 provides examples of relevant project experience for proposed team members for services specific to monitoring reference sites.

TtEMI offers complete stream reach assessment services using reference sites. Ms Norris will be supported by several members who have extensive experience in stream reach and watershed evaluation services that characterize geomorphology, habitat and stream health using various field and remote sensing methods such as Rosgen and GIS imagery analysis. **Dr Bin Zhang** and **Jason Brodersen** have developed TMDL sampling designs using reference sites, and **Dr. Ed Surbrugg** has more than 20 years of experience identifying and delineating wetlands and is thoroughly familiar with wetland habitats throughout Montana.

4.2.4 TMDL Targets

TtEMI understands and will comply.

Lead Technical Coordinator: Kathryn Norris

TtEMI provides services to assist watershed groups and agencies with developing quantitative water quality goals representing all applicable standards to support beneficial use. Our project team is composed of specialists with long time experience in Montana and a thorough knowledge of the existing and evolution of Montana's water quality standards. Our team is also supported by experts in load allocation, and aquatic health and wildlife habitat requirements. Our proposed technical lead, Kathryn Norris, applies meticulous attention to communication with agency staff when developing TMDL targets on her projects. In addition, our project team is staffed with several scientists and engineers that have served State of Montana agencies in other projects, and as previous employees, and understand the need for maintaining good communication.

Specific project team monitoring design experience is described below in this section. Field parameter measurement, sample collection, stream characterization experience is described under Section 4.2.2; Water quality modeling expertise is described under Section 4.2.12. Project team expertise in statistical analysis and information technical assistance is described under Sections 4.2.13 and 4.2.15.

Our company profile, a full description of proposed project team qualifications, and a description of our method of providing services and quality assurance is provided in Section 4.1. References are listed in Table 2. Figure 2 provides a summary of relevant expertise and credentials for project team members. Table 3 provides examples of relevant project experience for proposed team members for services specific to TMDL targets.

Two members of the TtEMI project team (**Dr. Bin Zhang** and **Jason Brodersen**) are experienced in developing TMDL water quality targets for large and small watersheds. **Chris Martin** has experience in providing 303(d) List reassessment services to the Department of the Navy including compilation of all available information within a data category (physical/habitat, biology or chemistry/toxicity) for a given stream segment or water body; evaluation of available data to determine if the water body is threatened, or partially supporting, or not supporting a designated beneficial use. TtEMI services also include evaluating a portion of a water body for credible data which may indicate that a smaller water body segment is uniquely impaired or fully supporting its beneficial uses. Proposed team members **Jennifer Guigliano** and **Kathryn Norris** are experienced in developing load allocations for point and non-point sources and development of watershed water quality goals.

4.2.5 TMDL Source Assessment/Delineation

TtEMI understands and will comply.

Lead Technical Coordinator: Kathryn Norris

TtEMI assists local and state agencies in assessing watersheds for water quality and linking identified impairments with their sources. Our pollutant source determination services include identification of data gaps, development of monitoring programs and statistical analyses designed to reduce the uncertainty about watershed conditions, and isolation of the probable sources of pollution. Our project team is composed of specialists in investigative hydrology, remote sensing, statistics and GIS that work together to identify and quantify pollutant sources.

Project team TMDL source assessment and delineation expertise programs is described below in this section. Field parameter measurement, sample collection, stream characterization experience is described under Section 4.2.2. Our team expertise in TMDL targets and load allocation is described under Sections 4.2.4 and 4.2.6. Project team remote sensing expertise is described under 4.2.11. Water quality modeling expertise is described under Section 4.2.12. Project team expertise in statistical analysis and information technical assistance is described under Sections 4.2.13 and 4.2.15.

Our company profile, a full description of proposed project team qualifications, and a description of our method of providing services and quality assurance is provided in Section 4.1. References are listed in Table 2. Figure 2 provides a summary of relevant expertise and credentials for project team members. Table 3 provides examples of relevant project experience for proposed team members for services specific to source assessment and delineation.

Our proposed project team has recent experience in the areas of source water assessment and delineation, load allocations, determining TMDLs and TMDL targets, water quality modeling and statistical analysis. Two members of the TtEMI project team (**Dr. Bin Zhang** and **Jason Brodersen**) are experienced in TMDLs and developing water quality targets specifically for TMDL project watersheds. The team is also composed of resource specialists (**Dave Donohue**, **Chris Martin**, **Brian Antonioli**, and **Alice Stanley**) with a thorough knowledge of applicable narrative and numeric water quality standards and years of experience evaluating local area streams and watersheds using these standards. The TtEMI Helena office has provided technical assistance to federal, state, municipal, and private clients throughout Montana by preparing source water area delineations, contaminant source assessments, susceptibility determinations, and public notification support. Chris Martin is experienced in quantifying pollutant sources, developing load calculation, and designing appropriate BMPs. **Ed Madej** and **Susan Parks** have extensive experience with the application of GIS and remote sensing to source assessment and delineation. The team will also be assisted by **Joe Michaletz** who provides services in quantitative source assessment utilizing field-based monitoring and the interpretation of aerial photographs, digital images, and GIS coverages. Ms. Alice Stanley and Mr. Dave Donohue conducted 40 source water delineation, inventory, and susceptibility assessment reports at rest areas and springs throughout Montana.

4.2.6 TMDL Load Allocations

TtEMI understands and will comply.

Lead Technical Coordinator: Kathryn Norris

TtEMI assists local and state agencies in developing load allocations in conjunction with source assessment and delineation. Project team load allocation is described below in this section. Our TMDL target and source assessment and delineation services are described under Sections 4.2.4 and 4.2.5. Field parameter measurement, sample collection, stream characterization experience is described under Section 4.2.2. Project team remote sensing expertise is described under 4.2.11. Water quality modeling expertise is described under Section 4.2.12. Project team expertise in statistical analysis and information technical assistance is described under Sections 4.2.13 and 4.2.15.

Our company profile, a full description of proposed project team qualifications, and a description of our method of providing services and quality assurance is provided in Section 4.1. References are listed in Table 2. Figure 2 provides a summary of relevant expertise and credentials for project team members. Table 3 provides examples of relevant project experience for proposed team members for services specific to TMDL load allocations.

Our project team includes **Chris Martin**, **Dr. Bin Zhang** and **Kathryn Norris**. **Dr. Bin Zhang** is currently conducting a full-scale TMDL approach for the Pearl Harbor watershed on Oahu, Hawaii that includes: data collection and monitoring plans, and load allocations. In a current project on the Calleguas Creek Watershed in California, **Chris Martin** and **Kathryn Norris** are using watershed background information and collecting monitoring data to establish existing baseline relationships among nutrient concentrations, stream flow pollutant loads, natural processes, land use, and activities. Results are used to calculate pollutant loading from point and nonpoint sources and to identify specific load allocations for various sources. Chris Martin has extensive experience in quantifying pollutant sources, developing load calculation, and designing appropriate watershed best management practices (BMPs).

4.2.7 Total Maximum Daily Loads

TtEMI understands and will comply.

Lead Technical Coordinator: Kathryn Norris

TtEMI assists local and state agencies in developing TMDLs. Project team TMDL development expertise is described below in this section. Our team expertise in developing waste load allocations to point sources, and load allocations to natural background and non-point sources is described in Section 4.2.6. Our team expertise in TMDL targets is described under Section 4.2.4. Project team remote sensing expertise is described under 4.2.11. Water quality modeling expertise is described under Section 4.2.12. Project team expertise in statistical analysis and information technical assistance is described under Sections 4.2.13 and 4.2.15.

Our company profile, a full description of proposed project team qualifications, and a description of our method of providing services and quality assurance is provided in Section 4.1. References are listed in Table 2. Figure 2 provides a summary of relevant expertise and credentials for project team members. Table 3 provides examples of relevant project experience for proposed team members for services specific to TMDL development.

Our proposed project team has recent experience in the development of TMDLs. **Dr. Bin Zhang** and **Jason Brodersen** have worked with several state agencies to develop TMDLs that help watershed stakeholders meet water quality standards.

4.2.8 Stakeholder Participation

TtEMI understands and will comply.

Lead Technical Coordinator: Linda Daehn

TtEMI has a long history of supporting their clients with public involvement and community relations. Specific to the TMDL program, TtEMI assisted the Kailua Bay Advisory Council (KBAC) in developing a Strategic Water

Quality Improvement and Implementation Plan to improve water quality in the Kailua waterways system on Oahu, Hawaii. TtEMI solicited members and formed an advisory- stakeholders group (ASG), made up of stakeholders and community members, to provide technical input to the plan. TtEMI also facilitated group meetings throughout the development of the plan to encourage stakeholder participation in describing and prioritizing water quality problems, identifying appropriate remedial measures, and outlining a strategy for implementing the most effective and feasible measures. At the final ASG meeting, TtEMI delivered a very well received and highly praised presentation to the ASG, the state, the city, U.S. Fish and Wildlife, State Fish and Game, U.S. Army Corp of Engineers, and the EPA outlining the implementation of the plan.

TtEMI also worked with the U.S. EPA, Region 5 and the Great Lakes National Program Office, U.S. EPA Regions 2 and 3, and the Great Lakes States, to develop an analysis and strategy to establish TMDLs for the Great Lakes, or impaired portions thereof. TtEMI supported preparation of the First Lake Michigan Lake-Wide Management Plan (LaMP) published in April 2000 as part of the U.S.-Canadian LaMP 2000 initiative.

TtEMI is assisting EPA in establishing and maintaining a forum for discussion of with all relevant public agencies, tribes and stakeholders, private interest groups and environmental groups. TtEMI will research, as well as compile and summarize all technical information provided by workgroup members and others. TtEMI will assist the EPA in reviewing TMDL submittals from the states, and provide written reports.

TtEMI also provides TMDL training and workshops to stakeholders and community members. The trainings address such issues as the overall role of the TMDL Program, the elements that compose an approvable TMDL, and the use of the QUAL2E model. TtEMI provided TMDL training to the Ohio Environmental Protection Agency (OEPA), Division of Surface Water staff. The OEPA listed 881 segments on its 1998 303(d) list and targeted all of the segments within four separate basins for TMDL development. TtEMI provided training for the staff responsible for developing TMDLs in these watersheds and investigated potential TMDL technical approaches for the listed waters.

Ms. Linda Daehn, of the local TtEMI office, will draw on this expertise to engage public involvement and local stakeholder participation in the State of Montana TMDL program. Ms. Daehn has 16 years of experience in public affairs, technology transfer, and environmental communications. She is experienced in stakeholder participation, coordination of stakeholder groups, facilitating public meetings, information transfer, and preparation of technical manuals. Ms. Daehn will be assisted by **Ms. Sarah Sullivan**, who has extensive experience in developing and implementing public involvement strategies and in facilitating meeting with stakeholders. Ms. Daehn will also be assisted by **Mr. Jason Brodersen**, who was instrumental in the development of the KBAC ASG and the highly praised implementation plan for improving the Kailua waterway. In addition to these key project personnel, the proposed TtEMI project team includes the local experience of **Dave Donohue**, **Alice Stanley**, **Katy Norris**, and **Laura Newman** with extensive experience in public relations and communication.

Our TtEMI company profile, a full description of proposed project team qualifications, and a description of our method of providing services and quality assurance is provided in Section 4.1. References are listed in Table 2. Figure 2 provides a summary of relevant expertise and credentials for project team members. Table 3 provides examples of relevant project experience for proposed team members for services specific to stakeholder participation.

4.2.9 TMDL Effectiveness Monitoring

TtEMI understands and will comply.

Lead Technical Coordinator: Kathryn Norris

The proposed TtEMI team has extensive experience in the collection and data management of surface water sampling for organic and inorganic chemicals, biological components (such as macroinvertebrates, algae and chlorophyll), sediment load, and trace metals. Project team monitoring expertise is described below in this section.

Our company profile, a full description of proposed project team qualifications, and a description of our method of providing services and quality assurance is provided in Section 4.1. References are listed in Table 2. Figure 2 provides a summary of relevant expertise and credentials for project team members.

Example projects presented in Table 3 highlight our team expertise relative to water quality monitoring of lakes and streams. **Joe Faubion** and **Randy Laskowski** will provide most field sampling services. Both have conducted field monitoring of surface throughout Montana for over 15 years. **Mr. Faubion** also served as the TMDL field sampling coordinator for the TMDL study of Powder and Tongue Rivers. Our project field sampling team also includes several highly experienced hydrologists and engineers including **Chris Martin**, **Dave Donohue**, and **Brian Antonioli**. Together this team has a wide range of knowledge in surface water assessments and water quality monitoring and evaluation. Our field personnel also have extensive experience in the collection of surface water and groundwater samples that must meet strict quality control protocol under the EPA Superfund program. Our assessment monitoring services also include remote sensing to assess stream geomorphology, flood plain and watershed characteristics. Section 4.2.1 provides a description of our water quality monitoring design services.

4.2.10 Geographic Information Systems (GIS) Services

TtEMI understands and will comply.

Lead Technical Coordinator: Ed Madej

Helena's TtEMI staff has provided GIS services for watershed characterization, modeling and management for over seven years. Project team GIS expertise is described below in this section. Our company profile, a full description of proposed project team qualifications, and a description of our method of providing services and quality assurance is provided in Section 4.1. References are listed in Table 2. Figure 2 provides a summary of relevant expertise and credentials for project team members. Table 3 provides examples of relevant project experience for proposed team members for GIS services.

Our GIS project team is lead by **Mr. Ed Madej**, who will be assisted by **Ms. Susan Parks**, **Mr. Aaron Cade**, and **Mr. Chris Martin**. TtEMI uses the full suite of Environmental Systems Research Institute (ESRI) GIS software, including ArcInfo and ArcView for ArcGIS 8x-9x, and many of the ArcGIS extensions. TtEMI uses Spatial Analyst and ArcHydro for watershed delineation and modeling, as well as 3D Analyst for visualization. Image Analyst is used for processing aerial photos. TtEMI uses both Oracle and Microsoft SQL Server as relational databases and links to GIS through ESRI's Spatial Database Engine (SDE) and ArcIMS.

Mr. Madej assisted the U.S. Environmental Protection Agency using GIS to plan cleanup of the Tenmile Watershed Superfund Site, five miles west of Helena. During two summers of field investigations, GPS and low altitude aerial photography were used to pinpoint the location of abandoned mines upstream from the city of Helena's water treatment plant. Mr. Madej integrated results from water and soil samples into a series of thematic maps of the watershed in order to prioritize cleanup activities for the most damaging mines.

Mr. Madej used GIS to create a series of watershed maps for southeastern Idaho's phosphate mining region. The maps were created from digital elevation models (DEMs) and then analyzed high resolution aerial photos to quantify the amount of land disturbed by open pit phosphate mining in each watershed. Historical water quality data along with a field season of new water quality samples was mapped onto a data layer of streams from the national hydrography data set to identify impacted stream reaches. This impacted stream data was integrated with the state of Idaho's TMDL program information for southeast Idaho watersheds.

In the upper Yellowstone watershed above Livingston, Montana, Mr. Madej worked with the Montana Natural Heritage Program to combine decades of historical information on endangered, threatened and rare species with public and private land ownership layers to identify biodiversity "hotspots" for future conservation efforts. A simple mathematical model was used to combine the importance of a particular rare species with the frequency of sightings in an area to rate the biological importance of a portion of the watershed.

TtEMI has also worked with the Montana Department of Environmental Quality's Industrial and Energy Minerals Bureau to provide watershed characterizations of pre-mining and post-surface mined areas near Colstrip, Montana. These watershed analyses included generation of large-scale topographic surfaces in mine

permit areas, comparisons of detailed stream networks, and visualizations of proposed mine reclamation plans.

Mr. Ed Madej, **Ms. Kathryn Norris**, and Mr. Chris Martin worked extensively with the U.S. Navy's Southwestern Region Engineering Division using GIS to produce stormwater protection plans for US Navy installations. For the San Nicholas Island Naval Reservation, these project team members took contour maps created from high-resolution aerial photography, converted them to DEMS, and used the specialized ArcHydro extension for ArcGIS to define watersheds on the 45,000 acre island. Possible contaminate sources such as fuel storage tanks were then mapped for each watershed.

For Point Mugu Naval Air Station and Port Hueneme Naval Base, Mr. Madej and Mr. Martin used GIS to identify drainage areas, and calculate amount of hard surfaced paved areas in each drainage, and identify locations for storm water sampling stations. Point Mugu Naval Air Station lies at the mouth of the Calleguas Creek watershed, which TtEMI has mapped to delineate landuses that contribute to non-point source pollution. The resulting information is being integrated with the State of California's TMDL program.

In addition, Mr. Madej has trained dozens of DEQ employees over the last decade in the use of ESRI's ArcView software for environmental planning. Attendees in our ESRI authorized classes have include employees from the DEQ's TMDL and source water protection programs, and two custom classes have been designed for DEQ's air quality program employees.

4.2.11 Remote Sensing

TtEMI understands and will comply.

Lead Technical Coordinator: Ed Madej

Helena's TtEMI staff routinely uses remote sensing technology (image processing and analysis) in conjunction with integrated GIS design, development to assist with water quality sampling, watershed restoration, harvest planning, biology, forestry, wildlife research, aquatic inventories and mine waste cleanup projects. Project team staff are familiar with the use of historical satellite imagery, (Landsat ETM+, 30 meter resolution multispectral imagery) to evaluate and classify land-use at a regional scale for a project where higher resolution imagery was cost prohibitive over a large geographic area. In addition, we have developed customized GIS databases in ArcGIS 8.2 to integrate remote sensing overflights with ground truthing operations to determine the functionality of remote sensing programs to detect changes in vegetation.

Project team remote sensing expertise is described below in this section. Our company profile, a full description of proposed project team qualifications, and a description of our method of providing services and quality assurance is provided in Section 4.1. References are listed in Table 2. Figure 2 provides a summary of relevant expertise and credentials for project team members. Table 3 provides examples of relevant project experience for proposed team members for remote sensing services.

Ms. Susan Parks will be the lead for remote sensing tasks. Ms. Parks has a Masters degree in GIS and Remote Sensing from the University of Denver, and a B.S. in Forest Resource Management and Biology. Ms. Parks will be assisted by lead GIS technical coordinator **Mr. Ed Madej** with 19 years experience in GIS and digital cartography and by **Mr. Aaron Cade** with 10 years experience maintaining and administering LAN networking environments and developing and managing relational databases in various formats and structures that ensure data normalization and reliability.

4.2.12 Water Quality Modeling

TtEMI understands and will comply.

Lead Technical Coordinator: Ed Madej

TtEMI has supported numerous watershed modeling efforts at the federal, regional, state and local levels. Our approach emphasizes working closely with the agency to develop an evaluation plan that models trends in water quality to aid in the selection of management controls for point and nonpoint sources. Every watershed is different and modeling efforts are tailored to meet the needs of the agency and watershed group. TtEMI used

models to define TMDL loading allocations, evaluate the current condition of the resource, and develop a watershed scenario for existing conditions and standards attainment. TtEMI employs models with various levels of complexity to meet the needs of the client.

Dr. Bin Zhang is the primary TMDL modeler for our project team. Dr. Zhang will be assisted by **Mr. Chris Martin**. **Mr. Aaron Cade** will provide data base management services and **Mr. Ed Madej** will assist with GIS-based risk assessment modeling efforts.

Our company profile, a full description of proposed project team qualifications, and a description of our method of providing services and quality assurance is provided in Section 4.1. References are listed in Table 2. Figure 2 provides a summary of relevant expertise and credentials for project team members. Table 3 provides examples of relevant project experience for proposed team members for watershed modeling services.

Dr. Bin Zhang has developed a continuous hydrologic model (HEC-HMS, moisture accounting) to simulate watershed hydrology and predict stream flows for Nawiliwili basin in Kauai, Hawaii to assess existing nutrient and sediment loads in Huleia Stream and several other streams. He also developed a WASP model for Huleia Estuary and Nawiliwili Bay to evaluate the water quality response to the pollution reductions.

Dr. Zhang is currently constructing a continuous hydrologic and watershed model (HSPF) to evaluate the water flow for a stream within the Pearl Harbor watershed to evaluate pollutant loads from various land use types. He is developing hydrodynamic (CE-QUAL-W2) and water quality models (WASP) to simulate the fate and transport of pollutant in the estuary.

Dr. Zhang also developed the hydrologic watershed model (HSPF) using BASINS to assess nutrient and sediment loads from various nonpoint and point sources in the Fox River Basin of Richland County, Illinois. Dr. Zhang also developed a river water quality model (QUAL2E) to simulate the pollutant fate in the river, and a lake water quality model to assess the lake response to different load reduction scenarios.

Dr. Zhang also developed a continuous water resource model for Wolf Lake in a Hammond, Indiana watershed to investigate long-term lake level fluctuation and made recommendations to sustain water supply to wetland in the system.

4.2.13 Statistical Analysis

TtEMI understands and will comply.

Lead Technical Coordinator: Ed Madej

The proposed TtEMI team has extensive experience performing statistics on water quality data for a variety of water quality and sediment sampling projects. TtEMI designs environmental sampling programs that include specialized procedures for estimating population parameters and optimization of environmental sampling programs. TtEMI has written customized computer codes for the analysis of censored data sets with multiple detection limits, and for estimating exposure-point concentrations and the statistical comparison of site and ambient data sets in the selection of contaminants of potential concern.

TtEMI uses statistical software applications, such as GPower and Visual Sampling Plan, for the optimization of sampling designs at hazardous waste sites. TtEMI provided statistical support for multiple risk assessment studies at Naval Air Station Point Mugu. TtEMI performed statistical screening on thousands of chemicals entries generated from surface water samples in support of human health and ecological risk assessments. Specialized computer codes were written and used to process and screen large amounts of sampling data for use in risk assessments.

Statistical analysis for this project will be conducted by **Dr. Ray Bienert**, **Mr. Chris Martin**, and **Mr. Aaron Cade**. Dr. Binert performs statistical analysis and risk assessment, as well as develops computer code, Mr. Martin performs statistical analysis and develops written tables and summaries of the statistical data, and Mr. Cade designs database programs and stores, manipulates, and retrieves data in the database.

Project team statistical analysis expertise is described below in this section. Our company profile, a full description of proposed project team qualifications, and a description of our method of providing services and quality assurance is provided in Section 4.1. References are listed in Table 2. Figure 2 provides a summary of relevant expertise and credentials for project team members. Table 3 provides examples of relevant project experience for proposed team members for services specific to statistical analysis.

Dr. Bienert currently provides oversight and statistical support on ecological and human health risk assessment studies at TtEMI offices throughout the country. His area of special interest is the design and optimization of environmental sampling programs and the analysis of environmental background data sets. Dr. Bienert is knowledgeable of current EPA and Navy guidance for the statistical analysis of environmental data sets

Mr. Chris Martin, assisted by Mr. Aaron Cade provided statistical support for multiple risk assessment studies at Naval Air Station Point Mugu. TtEMI performed statistical screening on thousands of chemicals entries generated from surface water samples in support of human health and ecological risk assessments. Specialized computer codes were written and used to process and screen large amounts of sampling data for use in risk assessments.

For a different project at the same facility, Mr. Martin performed statistical analysis on sediment and surface water data in the watershed to identify a baseline reference area that is not affected by potential on-site contamination but upstream sources in the Calleguas Creek watershed. A novel weight-of-evidence approach for the evaluation of multiple lines of evidence during risk characterization was developed.

4.2.14 Analytical Laboratory Services

TtEMI understands and will comply. While TtEMI can arrange for these services upon request using a subcontractor, we are not proposing to provide these services.

4.2.15 DEQ Electronic Data/Information Technical Assistance

TtEMI understands and will comply.

Lead Technical Coordinator: Ed Madej

TtEMI has provided information technology (IT) services in collecting and managing electronic data internally, and for numerous state and federal agencies. We utilize modern relational databases to store electronic data. Data can be stored in SQL Server 2000 running on a Windows 2000 Server, or in Access databases. Analytical laboratory data is stored in a way that is highly normalized and structured to minimize redundancy and complexity.

TtEMI has experience in providing data to data consumers (i.e. report writers, data validators, risk assessors, GIS users, and public users) in numerous electronic file formats, via CD, Internet, Email or FTP. TtEMI staff has completed many data importing and data migration jobs. TtEMI can meet the data requirements for STORET outlined in Attachment A (Interim LIMS EDD Format/SIM Field Specifications). EDD from the laboratories can be imported into SQL data stores and then exported to meet STORET and Oracle requirements.

TtEMI can provide data reports in many compatible formats. Utilizing current tools in Access, Excel, Crystal Reports, Dreamweaver, FrontPage and ArcView, TtEMI can create customized data reports, charts, graphs, tables and thematic maps. Special purpose tables with statistical analysis and other pertinent information can be used for risk assessors. GIS users can create thematic maps to illustrate data spatially. Data can be exported or linked to Excel for further analysis and reporting. Crystal Reports can generate tables and reports in widely accessible formats. Data driven websites can be used to display custom queries to the public and provide data downloads in compatible formats such as Excel or CSV files.

Project team IT expertise is described below in this section. Our company profile, a full description of proposed project team qualifications, and a description of our method of providing services and quality assurance is provided in Section 4.1. References are listed in Table 2. Figure 2 provides a summary of relevant expertise

and credentials for project team members. Table 3 provides examples of relevant project experience for proposed team members for services specific to information technology and electronic data management.

Mr. Aaron Cade has provided the DEQ with services in conversion and migration of historic data for the Lockwood Solvent Site. Historic data was taken from hardcopy and electronic sources, evaluated, then normalized and checked for quality. The resultant dataset was then imported into TtEMI's database and made available for consumption. Data was stored in a relational database in SQL Server 2000. Queries and reports were generated for the client, internal and external users and for representation in GIS figures. Helena TtEMI staff worked with the lab to ensure currently collected data would be reported electronically and in a compatible format. Customized data import forms were created to facilitate complete data entry and proper data quality.

Lockwood Solvent Site Analytical Database Tasks Included:

- Creation of database compatible with client's prerequisites addressed.
- Cleanup and Import of historical data as well as data from previous contractors.
- Ongoing import of electronic analytical data from laboratory.
- Data analysis and reporting using Excel, Access, Crystal Reports
- Data warehousing in SQL Server.
- GIS/data linked figures.
- Custom query creation for reports and tables.
- Periodic "Data snapshots" of entire database in Access file format for client and end users.

Mr. Cade has created customized data collection programs for field data collection on Palm Pilots and Pocket PC PDA devices. Using third party database programs Mr. Cade simplified and streamlined field data collection efforts. By making data electronic, information becomes immediately available, better structured and more reliable. Completely custom applications written for Pocket PC using Visual Basic .NET for Compact Framework have further decreased paper copies and incomplete data collection.

Examples of Validation and Emplacement Database for the Montana Army National Guard

- Access used to design the database for this project.
- Tables were created to hold Unexploded Ordnance data.
- Data was collected in the field and entered into a customized GUI on Pocket PCs
- Data is synchronized to the Access back end.
- All previous data collection was in hardcopy only; creating an electronic form has saved time and money.
- Palm Pilot Database Programming for the U.S. Navy.
- Programmed two Palm Pilot m500 Personal Digital Assistants (PDAs) for data collection.
- The program links the PDA to a Microsoft Access database on a PC.
- The forms on the PDA were designed to be simple and easily updatable.
- The database can be queried and datasheets printed rather than sorting hundreds of hand-written data collection sheets, offering better and more accurate data management to the client.

4.2.16 Heavy Equipment Operators

TtEMI understands and will comply. While TtEMI can arrange for these services upon request using a subcontractor, we are not proposing to provide these services.

4.2.17 Revegetation Services

TtEMI understands and will comply.

Lead Technical Coordinator: Alice Stanley

TtEMI has completed revegetation services at nearly twenty abandoned mine and wetland reclamation projects across Montana. TtEMI revegetation and reclamation specialists include biologists, soil scientists, and erosion control specialists that have completed all phases of revegetation tasks from the characterization of the topsoil and borrow material for agronomic properties through seeding and installation of erosion control materials. Revegetation services have focused on working with, and enhancing, available soil materials obtained for on

site or nearby borrow sources. Developing and reestablishing plant-required nutrient levels through the addition of inorganic and organic amendments has proven to be essential for long-term revegetation success. Site-specific seed mixture formulations have been completed for a wide range of sites and designated landuses. The inclusion of native and introduces grasses has been evaluated for each site based on the designated landuse, landowner preferences, probability for weed infestation, and other site-specific factors. TtEMI has experience working with many local seed, shrub, and tree stock providers. TtEMI has also worked with numerous local elevators and fertilizer distributors to ensure the soil amendments are locally successful and obtained at the best available cost.

Project team land restoration and revegetation expertise is described below in this section. Our company profile, a full description of proposed project team qualifications, and a description of our method of providing services and quality assurance is provided in Section 4.1. References are listed in Table 2. Figure 2 provides a summary of relevant expertise and credentials for project team members. Table 3 provides examples of relevant project experience for proposed team members for revegetation services. A completed price sheet for revegetation services is provided in Appendix D.

Dr. J. Edward Surbrugg has extensive experience in developing and implementing site restoration and revegetation plans. Dr. Surbrugg has a Bachelor's degree in Range Ecology, Master's degree in Land Rehabilitation, and a Ph.D. in Soil Science. Dr. Surbrugg worked for 5 years with the Montana Opencut Mining Bureau (sand and gravel mining) with responsibility for the reviewing, permitting, and inspection of mined and reclaimed bentonite, clay, scoria, sand, and gravel sites throughout a 20 county region of eastern Montana. Dr. Surbrugg analyzed soil and revegetation properties, specifically relating to plant species adaptation, soil nutrient imbalances, saline and sodic soil problems, and soil salvage methods. Dr. Surbrugg will be assisted by **Ms. Jennifer Guigliano**. Ms. Guigliano is an environmental engineer with experience in site restoration design for habitat protection.

One example of TtEMI's revegetation services is the Curlew Mine reclamation project completed for the Montana DEQ near Victor, Montana. Dr. Surbrugg's design for site revegetation included seedbed preparation, seeding, and erosion control installation for the 30-acre site. Coversoil was manufactured on site using available borrow material and incorporated organic compost materials. Multiple site-specific seed mixtures were developed using hardy and metal-tolerant native grass and forb species. Special provisions were incorporated into the revegetation plan to minimize noxious weed infestation and promote successful establishment of the seeded plant species. Reclamation and revegetation achievements at this site were outstanding and the Curlew Mine project was nominated as Montana's entry for the National Association of Abandoned Mine Land Programs, Outstanding Mine Reclamation Project for the year.

4.2.18 Watershed Coordination

TtEMI understands and will comply.

Lead Technical Coordinator: Linda Daehn

Under federal environmental laws, government agencies are required to inform the public on environmental actions and give the community an opportunity to become involved in the decision making process. TtEMI assists its clients in ensuring a positive outcome to community relations initiatives; this is critical to the success of many environmental investigation, permitting, and restoration projects.

Project team watershed coordination is described below in this section. Stakeholder collaboration expertise is described in Section 4.2.8. TtEMI public communication and educational services are described under Sections 4.2.21 and 4.2.23.

Our company profile, a full description of proposed project team qualifications, and a description of our method of providing services and quality assurance is provided in Section 4.1. References are listed in Table 2. Figure 2 provides a summary of relevant expertise and credentials for project team members. Table 3 provides examples of relevant project experience for proposed team members for services specific watershed coordination.

Ms. Linda Daehn will oversee watershed coordination tasks. Ms. Daehn is experienced in organizing and facilitating public meetings. Ms. Daehn will be assisted by **Ms. Sarah Sullivan, Ms. Alice Stanley, and Ms. Alane Dallas**. Ms. Sullivan is experienced in researching and securing funds, organizing public meetings, facilitating public meetings, and representing groups at conferences. Ms. Stanley served on the Lewis and Clark County Watershed Protection District Board for six years, and as board chair for three of those years. Ms. Stanley is familiar with watershed group interests and dynamics. Ms. Alane Dallas has assisted Ms. Daehn with the preparation and facilitation of numerous stakeholder meetings for resource management projects. Ms. Dallas is skilled in the preparation of fact sheets designed for public understanding and in meeting facilitation.

Ms. Linda Daehn assisted the U.S. Environmental Protection Agency (EPA) Region 8 and **Mr. Brian Antonioli** in providing community relations support for environmental activities associated with the Upper Tenmile Creek Superfund Site in Rimini, Montana. This involved identifying and coordinating with property owners within the affected watershed. TtEMI then assisted in preparing and distributing an informational package that was sent to these property owners and attended public meetings.

TtEMI also assisted the Montana DEQ with public meetings on the ASARCO Rock Creek Environmental Impact Statement. This included preparing posters and other graphics for use at public meetings and providing technical experts to help convey information and answer questions.

4.2.19 Communication/Educational Services – Information & Education

TtEMI understands and will comply. While TtEMI can arrange for these services upon request using a subcontractor, we are not proposing to provide these services.

4.2.20 Communication/Educational Services – Contract Administration

TtEMI understands and will comply. While TtEMI can arrange for these services upon request using a subcontractor, we are not proposing to provide these services.

4.2.21 Communication/Educational Services – Information Transfer & TMDL Technical Editing

TtEMI understands and will comply.

Lead Technical Coordinator: Linda Daehn

TtEMI has worked extensively in communicating complex environmental data and information to target audiences and the public. The TtEMI Helena Office has an extensive multimedia department, specializing in designing, producing, and distributing information to target audiences using television, radio, and print media; producing pamphlets, brochures, guidebooks, and videos; developing and maintaining web pages. TtEMI's multimedia department is dedicated to the production of the highest quality dynamic and cutting edge media products and services. Through the combined expertise of graphic designers, web developers, computer animators, and programmers, a wide range of media-rich products are available including: broadcast quality videos, automated slide presentations, training programs and interactive web sites. Our products are deliverable on CD, DVD, tape or the Internet in a wide variety of formats. Other presentation services and materials available include posters, large format displays, technical and artistic illustrations, cover designs and page layouts. Web services consist of all stages of web site design including complete client customization, active server pages, Shockwave, interactive training, streaming media and secure web site hosting. TtEMI is also experienced in writing and distributing press releases; setting up public meetings; making presentations; organizing field trips; and providing technical editing services.

Project team information transfer and technical editing expertise is described below in this section. Expertise in the preparation of manuals is described under Section 4.2.23. Our company profile, a full description of proposed project team qualifications, and a description of our method of providing services and quality assurance is provided in Section 4.1. References are listed in Table 2. Figure 2 provides a summary of relevant expertise and credentials for project team members. Table 3 provides examples of relevant project experience for proposed team members for services specific to information transfer and technical editing.

For the Montana Army National Guard, the TtEMI Helena office, (**Ms. Linda Daehn, Ms. Alice Stanley, and Ms. Alane Dallas**), developed and is currently implementing a public relations strategy for the proposed withdrawal of the Limestone Hills Training Area (LHTA), near Townsend, Montana. This has included developing a comprehensive public relations plan; organizing and assisting in a series of public meetings; preparing and distributing press releases and advertisements for radio and print media; designing, producing and distributing informational brochures; preparing presentation materials and posters; organizing and assisting in an Open House of the LHTA; and facilitating stakeholder working group meetings. TtEMI also developed a project website. Many of the materials that TtEMI developed can be reviewed at this project website at www.limestonehillswithdrawal.com.

Ms. Daehn also managed another community relations project for the Montana Army National Guard which involved informing residents of the Helena Valley, Montana, that potentially dangerous unexploded ordnance (UXO) from military operations conducted in the 1950s may still be present on their property. TtEMI prepared a fact sheet that was sent to all residents in the area of concern. A UXO hotline was established to answer residents' questions; TtEMI staffed this UXO hotline, answering all questions and documenting each telephone call. TtEMI then prepared a press release and maps of the area for a press briefing. TtEMI also coordinated a public meeting to discuss the Guard's plan to address UXO in Helena.

Under the direction of Ms. Linda Daehn, TtEMI is also currently assisting the Bureau of Land Management, Butte Field Office in developing and implementing a public participation strategy for the environmental impact statement and revision of its existing Resource Management Plan. This has included developing a public participation plan; organizing and assisting in six public scoping meetings; preparing and distributing press releases; producing an informational brochure; preparing presentation materials and posters; and assisting in developing a project website. TtEMI also prepared a scoping summary report.

4.2.22 Land Use Planning Services

TtEMI understands and will comply.

Lead Technical Coordinator: Alice Stanley

TtEMI provides land use planning services to several state and federal clients. The Helena TtEMI office is currently assisting the U.S. Bureau of Land Management (BLM) with the development of a resource management plan (RMP) for an eight-county area in west central Montana and have provided natural resource and land use management services to the Department of the Navy. Our land use management services include:

- Analyses of current management situations including identification of data gaps.
- Identification of issues of concern.
- Evaluation of past management practices and policies for ability to meet an agency's desired future conditions.
- Identification of opportunities or reasons to change existing management practices.
- Assistance with developing appropriate management practices in compliance with applicable requirements and needs.
- Management plan development using an interdisciplinary approach to integrate overlapping resource management concerns and jurisdictions.
- Environmental analysis of proposed agency changes in land management under the Montana and the National Environmental Policy Act.
- Facilitation of agency collaboration and public participation.

Project team land use planning experience is described below in this section. Land use planning typically requires the use of other service areas described under Sections 4.2.8 (Stakeholder Participation), 4.2.10 (GIS), and 4.2.21 (Public Information and Education).

Our company profile, a full description of proposed project team qualifications, and a description of our method of providing services and quality assurance is provided in Section 4.1. References are listed in Table 2. Figure 2 provides a summary of relevant expertise and credentials for project team members. Table 3 provides examples of relevant project experience for proposed team members for services specific to land use planning.

Project experience described below applies to TtEMI personnel listed on this proposal (Figure 1). The technical lead for land use planning services is **Ms. Alice Stanley**. Ms. Stanley has access to extensive corporate expertise within TtEMI in natural resource management and watershed planning depending on agency land use planning needs.

Ms. Alice Stanley is currently assistant project manager for the revision of the BLM Butte Field Office Resource Management Plan and EIS. Ms. Stanley's responsibilities include project planning, agency coordination, coordinating support services, compliance tracking and resource evaluation. Ms. Stanley recently completed an analysis of the current management situation for BLM land in the eight-county region. Additional tasks include coordinating reports for Fish and Wildlife Service (Threatened and Endangered Species) and the Army Corps of Engineers (wetlands). Ms. Stanley is assisted by **Mr. J. Edward Surbrugg** who is evaluating land use planning for soils, wetlands and rangeland health. Ms. **Linda Daehn** and **Ms. Alane Dallas** provide public participation services for this project. **Ms. Jennifer Guigliano**, recently prepared a land use management plan for natural resources at the Naval Base Ventura County (NBVC) Point Mugu with assistance from Ms. Alice Stanley, **Ms. Kathryn Norris**, **Mr. Chris Martin**, and **Mr. Ed Madej**. The management plan integrated the base mission with the natural resource management mission for the installation. Preparation of the plan included an inventory of the soils, water, wetlands, plants, and animals that exist in the adaptive ecosystem under the stewardship of the Navy, a schedule for implementation, and how the Navy will integrate the natural resources management plan with other land and resource management activities at Point Mugu such as pesticide use, potential public access associated with the INRMP, access by federal and state conservation officials, consistency with coastal zone plans, and invasive species.

Ms. Stanley assisted in the preparation of an integrated cultural resource management plan and managed the preparation of an Environmental Assessment for the proposed Plan. Responsibilities included coordinating with the Montana Department of Military Affairs, the cultural resources contractor, the State Historic Preservation Office, all Montana tribes, and an in house interdisciplinary team.

As board chair for the Helena Open Lands Management Advisory Committee, Ms. Stanley designed the work plan and provided oversight for the preparation of a management plan for Helena's 1,700 acres of natural open space. Ms. Stanley worked closely with City staff and the contractor to develop a plan that addresses management of wildlife, native plants, forests, surface water, urban interface, and recreational use. The Plan was finalized by the City Commission February 2004.

4.2.23 Preparation of Technical Manuals or Circulars

TtEMI understands and will comply.

Lead Technical Coordinator: Linda Daehn

TtEMI has prepared hundreds of fact sheets and newsletters for a range of clients, including the Montana Army National Guard, U.S. Navy, the Bureau of Land Management, and EPA. The TtEMI Helena office routinely prepares and distributes informational material from fact sheets to multi-page circulars for federal clients. Project team expertise relevant to the preparation of regulatory guidance is described below in this section. Our company profile, a full description of proposed project team qualifications, and a description of our method of providing services and quality assurance is provided in Section 4.1. References are listed in Table 2. Figure 2 provides a summary of relevant expertise and credentials for project team members. Table 3 provides examples of relevant TtEMI project experience for services specific to regulatory guidance.

Ms. Alice Stanley authored two stormwater management guidance manuals under contract with the Montana DEQ. The guidance documents contain descriptions of stormwater management practices recommended for controlling the quantity and enhancing the quality of stormwater runoff at industrial, construction and mining sites. The manuals were designed to be used by industrial facilities and by DEQ staff for their evaluation of Stormwater Pollution Prevention Plans and Erosion Control Plans submitted by the regulated community.

- **Montana Guidance Manual for Industrial Storm water Pollution Prevention Planning, Best Management Practices Volume I, 1992.** Montana Department of Health and Environmental Sciences, 23 pp.

- **Montana Guidance Manual for Controlling Storm water Discharges: Best Management Practices Volume II, 1992.** Montana Department of Health and Environmental Sciences, 176 pp.

Ms. Stanley also developed a waste management brochure addressing the proper use of dry wells for the DEQ groundwater protection program. Ms. Stanley was also contracted with the Montana DEQ to provide guidance to the regulated community in the form of storm water management workshops at various locations in Montana.

TtEMI assisted the Navy in developing facility operations and maintenance and NEPA documentation guidance manuals to be used as reference and procedural guides for all Naval activities worldwide. The emphasis of the NEPA documentation related to impacts on historic sites and structures with particular cultural significance. For this project, EMI developed the navy guidance "NAVFAC M0-913, Historic and Archaeological Preservation", a guide for preservation and renovation of all buildings, structures, or sites of historical, architectural, archaeological, or cultural significance. We also conducted studies and analyses of historic resource maintenance procedures and techniques to assist maintenance planners and mechanics.

TtEMI provided education and information to the federal community in EPA Region X on the procurement of recycled products and on waste minimization. An executive order was set forth by the Bush Administration to promote federal agency recycling and the procurement of products made with recovered materials. As a result, EPA established procurement guidelines for government agencies to buy products made with recovered materials. TtEMI promoted the executive order and procurement guidelines by providing outreach through technical bulletins and workshops.